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Research and discussions in critical discourses and remedies in global health education

Edited by
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Research and discussions in critical discourses and remedies in global health education

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Editorial: Research and discussions in critical discourses and remedies in global health education

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Editorial on the Research Topic
Research and discussions in critical discourses and remedies in global health education

1 Introduction

The field of Global Health has evolved as an interprofessional and interdisciplinary approach to understanding and addressing the socio-economic, political and environmental factors that impact health around the world. Defined by Koplan et al. (2009) as distinct from both public health and international health, the field has continued to evolve together with dedicated frameworks for global health education that aim to promote equitable learning opportunities and social accountability for academic institutions. And academic communities of practice and partnerships have emerged along the way among institutions of varying income levels (high-income countries, middle-income countries, and low-income countries), diverse cultural beliefs and social circumstances with a goal of eliminating health disparities worldwide.

However, there is widespread concern that activities conducted under the auspices of Global Health often run counter to their intended objectives due to deeply ingrained colonial assumptions, racism, elitism, mistrust and other forms of bias entrenched in systems, institutions, and individuals. This Research Topic, "*Research and discussions in critical discourses and remedies in global health education*," seeks to delve into the frameworks and practices of Global Health Education to explore and address these historically reinforced ideologies. In the 19 papers that follow, the authors critically examine the impact of these historical biases and—importantly—provide examples of new pathways forward, focusing on bidirectional learning and partnerships, community engagement and power shifting, decolonizing dimensions and human dignity, and proposing new platforms for learning.

1.1 Decolonizing dimensions and human dignity

The legacy of colonialism in high-income countries (HICs) has influenced power structures, resource distribution, and priorities in health systems around the world. This has led to entrenched biases (both implicit and explicit) and mistrust between HIC-based and lower-middle-income-country (LMIC)-based institutions. Additionally, in many countries, medical education and global health collaborations are conducted in English when local languages are spoken by patients and providers. Similarly, biomedical explanatory models are prioritized over indigenous perspectives on health and healing both in teaching providers and treating patients. Therefore, even the language of educational instruction in many LMICs still reflect traces of HIC colonization, leading to knowledge hierarchies that may devalue indigenous expertise and with resulting impacts on local healthcare delivery and education frameworks. Decolonization of health and clinical education systems is crucial for promoting equitable interventions that prioritize human dignity with the ultimate goal of providing optimal health for all. Institutions, stakeholders, community actors, and beneficiaries must raise awareness and promote practices that uphold gender equity and social inclusion of historically minoritized groups.

There are seven articles in this Research Topic that specifically address the issue of decolonization across a spectrum of interventions. Kalbarczyk et al. delved into existing global health education programs in search of data about the current incorporation of learning opportunities related to the colonial history of global health (including information about the spectrum of teaching strategies, support for faculty curricular design efforts, and institutional barriers related to implementation). Ngaruiya et al. used an implementation science framework to provide guidance on assessing and developing decolonization efforts within global health research endeavors and, importantly, evaluated four geographic axes of power dynamics across which decolonization might occur: Global North-Global South, Global South-South, Local Global South, and Local Global North. The remaining five articles in this section provide examples of proactive approaches toward decolonization of global health education. Hawks et al. undertook a review of experiential educational theory and best practices to develop an interactive framework to guide curricular development by highlighting key aims, barriers, and potential unintended consequences. Collins et al. describe the implementation and assessment of the impact of a global health book club within an undergraduate public health course. And three of the articles specifically address issues related to clinical global health education:

- Ratner et al. describe the development and assessment of a pilot course for medical students focusing on promoting knowledge and skills about decolonizing global health;
- Martin et al. describe their 10-year experience in implementing an immersive, month-long global health course for senior medical students, evaluating the impact of the course according to the four principles in Melby et al. (2016) Guidelines for Implementing Short-term Experiences in Global Health;
- Dozois et al. describe the end-result of a workshop that the Global Emergency Medicine Academy ran at the 2022 Society of Academic Emergency Medicine Annual Meeting, focused on addressing inequalities and increasing diversity in Global Emergency Medicine education—a toolkit containing strategies for addressing historical power dynamics, which highlights five key themes: access to educational opportunities; awareness and cultural humility; the use of language/vocabulary that avoids perpetuating colonial power structures; the importance of representation and valuing diverse expertise and lived experiences in designing education and research programs; and enhancing the global visibility of emergency medicine as a specialty and the recognition of the scholarly contributions of LMIC partners.

1.2 Bidirectional learning and partnerships

Many in the Global Health Education community have been shifting from historical knowledge-transfer frameworks that are HIC-learner centric, toward partnerships that incorporate bidirectional learning and bilateral institutional benefit. These newer partnership models respect local contexts and expertise while leveraging the resources of each institution to achieve shared objectives. They embody principles of equity, community focus, social inclusion, mutual respect, and benefit, emphasizing the value of engaging all stakeholders and community actors.

This Research Topic includes four articles which speak to the principles of bidirectional benefit and equitable partnerships. Achana et al. leverage the results of literature review and the lived experience of the authors as Global South educators and researchers, to highlight the critical role of Global North partners in promoting equitable global health research collaborations. The authors propose specific actions related to the assignment of key roles on grant proposals and authorship positions on publications; increased training of Global North students, faculty funders, and politicians about the importance of equitable partnerships; and a focus on increasing capacity building efforts within LMIC institutions with a goal of developing independent, sustainable research and mentorship infrastructure. In a similar vein, Rose et al. report on the results of a qualitative study examining the lived experiences of LMIC health researchers who collaborate with HIC partners, and used these findings to develop a set of five key recommendations aimed at helping HIC researchers and funders improve the collaborative nature of and prioritize bidirectional benefits within research partnerships.

With respect to the implementation of best practices, Rosenbaum et al. describe the relevance of the six principles of the Brocher Declaration (Prasad et al., 2022) to short-term experiences in global health for dental students, ensuring that these clinical learning opportunities are conducted ethically, sustainably, and are aligned with the priorities of host communities. This approach underscores the significance of mutual partnership, community empowerment, and capacity building, ensuring that global health engagements are impactful and rooted in bidirectional learning and collaboration. Importantly this effort encompasses governmental, non-governmental, academic, faith, and secular stakeholders.

Lastly, Li et al. use the example of the State University of New York (SUNY)-University of the West Indies (UWI) Health Research Consortium as a best practice example of a bidirectionally beneficial relationship that has built collaborative programs to address research, population health, and patient care capacity building needs to address a diverse array of public health priorities in the Caribbean. This consortium has a focus on both infrastructure/technology development, as well as multidisciplinary programs that are focused on specific clinical issues, ranging from infectious diseases to diabetes/nutrition and a spectrum of neurologic issues.

1.3 Community engagement and power shifting

Another aspect of the evolution of Global Health Education is a recognition of the importance of community voices and expertise in educational and scholarly endeavors. These approaches call for a transformative shift toward ethical, sustainable, and impactful engagements with global communities, foregrounding the principles of power shifting, sustainability, and centering community-led development. These principles mark a departure from traditional academic center-driven, top-down approaches, advocating instead for initiatives that are both ethical in their conception, driven by co-creation, and sustainable in their execution.

Kalyesubula et al. describe the educational model at the African Community Center for Social Sustainability (ACCESS), a community-based organization in rural Uganda which prioritizes the needs and empowerment of the local community through education, healthcare, and economic promotion, and invites HIC academic partners to align with community-based projects. This model leverages the resources of the HIC partners, along with the energy and skills of individual HIC students and faculty, to address the community needs while providing high quality educational experiences for HIC learners, as well as local learners in the ACCESS Community Health Worker training program, the Nurses and Midwifery School, and the Grace's Promise preschool.

Palazuelos et al. describe the experience of Compañeros En Salud (CES), the Mexico branch of Partners in Health, in developing a rural public health and clinical care delivery system in Chiapas, Mexico. This program similarly leverages relationships with academic institutions (in the United States, Mexico, and Europe) to provide educational opportunities for global health learners, but with a primary focus on sustainability and addressing the community priority of revitalizing the government healthcare infrastructure, in part by incentivizing Mexican physicians to do their mandatory, post-medical school social service year in communities in Chiapas, and then providing opportunities for some to stay on in various roles with CES (among other initiatives).

As a third example of power shifting, Goldberg et al. describe the experience and impact of a program focused on increasing research mentorship capacity in Nigeria and Tanzania by training local faculty to serve as facilitators of mentorship training. As the authors describe, the facilitation approach is designed to guide learners in constructing their own knowledge that is contextualized to their own experience and needs, representing a departure from the traditional transmission-based educational framework which is more common around the world (and can be seen as a vestige of colonial learning strategies). This example uses the idea of learner-centered education to explore concepts of power and positionality, which the authors reported as themes that resonated with the program participants. And, per the evaluation described in the article, these ideas were seen as acceptable and practical to the participants.

1.4 Platforms for learning

Conversations about Global Health Education theoretical and best practice developments naturally lead to practical discussions about the mechanics of implementing new learning strategies via learning platforms. Following the rapid transition to virtual modes of teaching and knowledge transfer that occurred as a result of the early years of the COVID-19 pandemic, three of the five articles in this category focus on technological developments, while the remaining two describe educational programs.

As the first technology-focused article in the Research Topic, Gicheru and Mwangi sought to explore the facilitators of and barriers to medical school faculty use of a digital learning platform at an academic institution in Kenya. While the majority of faculty reported having access to personal computers and internet at work, slightly more than half were even aware that they had an account on the institution's learning management system (LMS), and only a minority of those faculty reported feeling confident in having the skills needed to engage with learners on the LMS. As the authors describe, this case report demonstrates the importance of academic institutions seeking to understand and address this "digital divide" in the use of educational strategies, and note that this is an area in which various types of institutional partnerships may be able to provide solutions.

Botha et al. describe the benefits of simulation training as a strategy to improve infection prevention and control skills within undergraduate nursing education, with a specific focus on virtual reality as an untapped educational modality in LMIC. The authors note that virtual reality trainings can be constructed to optimize the development of critical thinking and clinical reasoning skills and have tremendous potential to standardize infection prevention and control training across communities and countries. Additionally, they describe specific adaptations to promote equitable access to virtual reality by minimizing the costs and technological infrastructure required, such as cell phone-based programs that use low-cost data modes or are fully downloadable and do not require access to cell data.

On a larger scale, Dykens et al. describe the development and launch of the Consortium of Universities for Global Health Capacity Strengthening Platform (CUGH-CPS). This novel web-based platform seeks to address a variety of inequities related to global health capacity building partnerships, including issues of unequal access to potential institutional capacity building partners and lack of transparency around institutional training priorities. Thus, the CUGH-CPS serves as a conduit for connecting institutions and programs that have specific healthcare workforce capacity gaps, with individuals and institutions around the world that have the expertise to provide assistance. This free,

online resource demonstrates the revolutionary potential of global matching platforms in transforming training and education for healthcare workers in resource-constrained settings.

With respect to educational programs that serve as learning platforms, Nawagi et al. describe the experiences of African health professions students (medicine, nursing, and pharmacy) participating in the GEMx Regional Elective Exchange Program. By facilitating South-to-South exchanges within Africa, the program underscores the importance of intra-continental collaboration, supported by international financial and technological assistance and other expertise when necessary. This initiative not only enhances the accessibility of international electives but also fosters a culture of knowledge sharing and sustainable healthcare practices among future healthcare professionals from a variety of disciplines. This approach highlights the program's commitment to promoting mutual understanding and cooperation.

Lastly, Shah et al. report on the results of a survey of new African medical schools (defined as having been established with in the prior 20 years) which collated information about a host of characteristics, including demographics, operational details (e.g., admissions policies, evaluation and accreditation, faculty development), curricula and assessment, research capacity, and postgraduate training opportunities. Relevant to the prior discussions of the incorporation (or lack thereof) of instruction technology, it is notable that more than 75% of the survey respondents reported using electronic platforms and information technologies for instruction.

2 Conclusion

In the quest to engage in critical discourses and develop evidence-based guidance to remove supremacy in global health practice and dismantle systems built upon colonial frameworks (Abimbola and Pai, 2020), several key principles and models emerge as guiding lights, which unsurprisingly are foundational to decolonization. The Brocher Declaration, for instance, provides an ethical compass for global health initiatives, underscoring the importance of mutual partnerships and community empowerment. Similarly, the ACCESS and CES models champion local needs, robust partnerships, and community engagement as the bedrock of sustainable improvements in health, education, and overall community wellbeing.

However, the journey toward decolonization in global health practice necessitates confronting and mitigating the impact of colonialist/supremacist biases in Global Health Education. This is a prerequisite for aligning the development of the field with its defined practice directions. The insights offered by the articles in this Research Topic are invaluable for educators striving to build more equitable practice communities and eliminate deep-rooted colonialist assumptions, racism, elitism, and other forms of bias within institutions and individuals.

Scholarship that centers the power, perspective, expertise, and ownership of traditionally disempowered or resource-deprived stakeholders can provide frameworks for anti-colonial and anti-racist global health. This paves the way for the development and implementation of initiatives that genuinely enhance the diversity, equity, and inclusivity of Global Health Education resources and programs. Together, the programs, resources, and information that have been selected for this Research Topic, outline a roadmap toward global health education frameworks and partnerships where sustainable capacity building and bidirectional benefit transition from being mere aspirations to tangible realities.

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Experiences of health professional students' participation in the GEMx regional elective exchange program in Africa

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Background: Given the significant gap in International Electives (IEs) opportunities for African health professions students, ECFMG|FAIMER through its Global Educational Exchange in Medicine and other health professions (GEMx) program launched a pilot African regional elective exchange program in 2016. During IEs, students have a choice of discipline they would like to learn, and the location, often at a host institution in a different country. This study provides an overview of health professional students' experiences through participation in the pilot GEMx regional elective exchange program in Africa.

Methods: This was a quasi-experimental, single-group post-test-only study using the survey method. Data were collected online using a self-administered survey through SurveyMonkey. Students (N =107) received emails with a link to the survey as they completed the electives. The survey was open for a month for each student and weekly reminders were sent.

Results: The survey obtained a 100% response rate. All postgraduate and undergraduate students from various professional training programs (n =107) reported gaining knowledge that was applicable back home. Over 43.4% (n =46) reported having formed professional networks that are valuable for career progression. More than half 59.8% (n =64) gained clinical skills and learned various procedures while 26.2% (n =28) recognized the need for increased reliance on history taking for disease diagnosis. More than a third, 34.6% (n =37) appreciated the different cultures and the effect of cultural beliefs on health outcomes.

Discussion and conclusions: The GEMx regional elective exchange program in Africa provided a useful platform that enabled health professional students at undergraduate and postgraduate levels in their respective disciplines to gain enhanced perspectives on health issues, acquire clinical knowledge and skills applicable to their home country, strengthen personal and professional development, and develop positive attitude change in various health care delivery approaches.

KEYWORDS

regional elective exchanges, Africa, internationalization in health professions education, students, South-to-South model

1. Introduction

Growing global health partnerships and initiatives have led to a significant emphasis on internationalization in higher education policies in numerous health professional training institutions (Engel et al., 2015). Internationalization in higher education refers to the integration of international/ intercultural dimensions into all activities of a training institution, i.e., teaching, curricula, staff, and structural function [Organisation for Economic Co-operation (OECD), 2004]. International Electives (IEs) among others have served as a popular and critical platform to strengthen internationalization approaches in various health training institutions by enhancing global exposure for health professional trainees (Gribble and Dender, 2013). This has been achieved through more training opportunities in institutional bilateral and unilateral partnerships with diverse countries (Muir et al., 2016). The majority of these partnerships have been North (high-income countries) to South (low and middle-income countries) collaborations (Basu et al., 2017). As a result, more than half (59.0%) of the students at undergraduate and postgraduate levels especially in medicine and other professions from high-income countries move to low and middle-income countries to learn and get exposed to different health systems and disease burdens (Law et al., 2013; Centre for International Mobility CIMO, 2015).

There is some evidence that IEs have contributed significantly to transformative education experiences through the acquisition of new knowledge and skills, enhanced global perspective, and improved personal and professional development (Dowell and Merrylees, 2009; Eaton et al., 2011). Furthermore, IEs taken in low and middle-income countries provide ample opportunities for evidence-based global health advocacy in resource-limited settings (Loftus, 2013; Kumwenda et al., 2014).

Despite the added benefits of participating in IEs, not all students globally can take advantage of opportunities to enroll in these electives. Students coming from African nations are particularly disadvantaged due to the high costs of electives in high-income countries, lack of information about available opportunities, difficulty getting accepted by international programs, coupled with challenges in obtaining a visa to study abroad (Gribble and Dender, 2013). This has led to a mobility imbalance with scarcely any African students traveling for electives to high-income countries while African institutions are hosting many students from high-income countries (Eaton et al., 2011; Tsang, 2011; Daniels et al., 2020). Research has shown that South-to-South (between low and middle-income countries) regional partnerships have yielded fruitful outcomes in global health, especially in malaria, HIV care, and drug pricing (Muir et al., 2016). However, little is known about the feasibility and outcomes of the South-to-South (regional) model of hosting students and creating transformative education experiences *via* short-term electives for health professional training/learning in Africa.

Over the past 20 years, the Educational Commission for Foreign Medical Graduates (ECFMG) and the Foundation for Advancement of International Medical Education and Research (FAIMER) have responded to a changing environment in global health professions education through FAIMER global faculty development programs and the creation of new models of student educational partnerships (ECFMG, 2019). FAIMER promotes excellence in global health professions education through programmatic and research activities and aims to be the trusted global authority on healthcare education as it moves into its next decade (FAIMER, 2021). On identifying a significant gap in IEs opportunities for African students, ECFMG through its Global Educational Exchanges in Medicine and the health professions (GEMx) program launched a regional elective exchange program promoting mobility within Africa in 2016 and had 107 students who participated in the pilot from 2017 to 2018 (GEMx, 2019). The undergraduate students who participated in the program were from medicine, nursing, pharmacy, and laboratory medicine disciplines. The postgraduate students were from the ophthalmology and pathology specialties.

This paper reports the learning experiences of health professional students' participation in the GEMx regional elective exchange program in Africa. The research question that we aimed to answer was, "What are the experiences of health professional students' participating in the GEMx regional elective exchange program in Africa?"

2. Materials and methods

2.1. GEMx regional elective exchange program description

The GEMx regional elective exchange program in Africa utilized a multilateral approach to partnership that allowed reciprocity and elective diversity for participating institutions. A web-based application system based on the ECFMG Medical School Web Portal (EMSWP) was provided by ECFMG to enable the centralization of mobility and tracking applications. Mini-grants of $3,000 per institution were provided by ECFMG to defray costs for students. All institutions waived administrative fees to enable affordability. ECFMG developed a coordinating center based in Kampala, Uganda, that oversaw and support the development and implementation of the program. Specifically, this center worked with partner institutions in Africa to develop and implement a memorandum of understanding, oversaw grant funds distribution and accountability, elective curriculum, offered technical support and training on the web application system, supported each institution in budget development, assisted all students with preparations required by the host institution, provided information for visa application requirements, administered a post elective survey, and ensured each student submitted a participation report after participation. The duration of electives was about 4 weeks for undergraduate and 4 to 8 weeks for postgraduate students. For more details on the operational structure, the approaches, and lessons learned from the program see Nawagi et al. (2022).

GEMx partnered with five medical associations that encouraged their member institutions to participate in the program. These included the Medical Education Partnership Initiative (MEPI), the Nursing Education Partnership Initiative (NEPI) which both later merged to form the African Forum for Research and Education in

Abbreviations: GEMX, Global Educational Exchanges in Medicine and the Health Professions; IEs, International electives; AFREhealth, African Forum for Research and Education in Health; COECSA, College of Ophthalmology of East Central and Southern Africa; COPECSA, College of Pathology of East Central and Southern Africa; EAHPEA, East African Health Professions Educators Association.

Health (AFREhealth), the College of Ophthalmology of East Central and Southern Africa (COECSA), the South-to-South initiative by the University of Dundee (Daniels et al., 2020), and the East African Health Professions Educators Association (EAHPEA).

2.2. Study design and measures

A single-group, post-test-only quasi-experimental, design using the survey method was used for this study. The research team developed a self-administered survey questionnaire based on the study objectives and a review of the literature to identify valid constructs for the population of interest. The questionnaire contained both close- and open-ended items. Besides student socio-demographics, the survey collected data about the student experience of the GEMx regional elective exchange program in Africa in the following areas: feedback on GEMx support and structure; obtaining academic credit at the home institution for program participation; activities students participated in, and student satisfaction with the host institution. The open-ended questions solicited in-depth detailed learning experiences and feedback from students (see Supplemental Material Appendix 1 for details of the questionnaire). Content and face validity of the tool was reviewed by senior ECFMG and FAIMER research team with expertise in measurement and survey research methodology. The Cronbach alpha was 0.72 for the tool.

2.3. Ethical considerations

Written and verbal informed consent was sought from every participant. Confidentiality was observed using study numbers and the data being password protected with access only to the research team. The study was approved by the Institutional Review Board (IRB) of Euclid University, School of Global Health, and Bioethics an intergovernmental and treaty-based institution under the United Nations Treaty Series 49006/49007 (Reference: IRB-2019-LTR-0705).

2.4. Study participants and data collection

Students who participated in the program were primarily in their clinical years of training in medicine, nursing, and pharmacy programs at undergraduate and postgraduate levels.

Immediately after completion of the elective, students were sent the post-elective survey using SurveyMonkey, an online platform widely used for data collection. Students were given 7 days to complete the survey with a follow-up reminder after a week to ensure their data were captured. Because students' electives were taken at varying times, the time of survey administration varied and was on a rolling basis, depending on when each student completed their elective. The survey obtained a 100% response rate.

2.5. Data analysis

Univariate analysis was conducted using the SPSS IBM Statistic Version 21 statistical package. Descriptive statistics such as mean, median, interquartile ranges, and standard deviations (SD) were conducted for continuous variables. Frequency distribution and percentages were done for categorical variables. The learning experiences of students' participation in the GEMx regional elective exchange placement were categorized into personal and professional development, clinical knowledge, global perspectives, and attitudes. Figure 1 shows the subcategories in each of the four terms used to report the student's experiences. These were adapted from Dowell and Merrylees (2009) that attempted to define the experiences of health professional students, participating in International Medical Electives (IMEs) as values of participation in IMEs (Dowell and Merrylees, 2009).

3. Results

Only those students who completed their electives in the program from January 2017 to December 2018 (2 years) and who provided informed consent were included in the study. Of the 108 students who enrolled in this program, only one student did not complete their elective while the rest of the 107 students completed their elective and gave consent, and therefore were included in this study.

GEMx worked with a total of 27 institutions in five Institutional Network associations located in 11 African countries during the pilot of its regional elective exchange program in Africa for 2 years (2017–2018). Table 1 shows the distribution of incoming and outgoing students among these 27 institutions.

3.1. Participants characteristics

As shown in Table 2, below, the vast majority of students 93.5% ($n = 100$) were undergraduates and almost 89.0% ($n = 95$) took 4-week electives. Close to two-thirds of the students were from medicine 63.6% ($n = 68$) and close to a third from Nursing 34.0% ($n = 34$).

3.2. Elective specialties taken by students

In total 18 elective specialties were offered and taken up by the students. As indicated in Figure 2, Internal Medicine ($n = 21$) was the most popular elective followed by midwifery ($n = 14$) and family medicine ($n = 13$). The specialties with lower participation rates (between 1 and 3 students) included medical nursing, theatre nursing, social medicine, emergency and trauma medicine, emergency, and trauma nursing, laboratory medicine, obstetrics and gynecology, anesthesia, and critical care.

3.3. Learning activities the students participated in

The various learning activities that the students participated in are shown in Table 3.

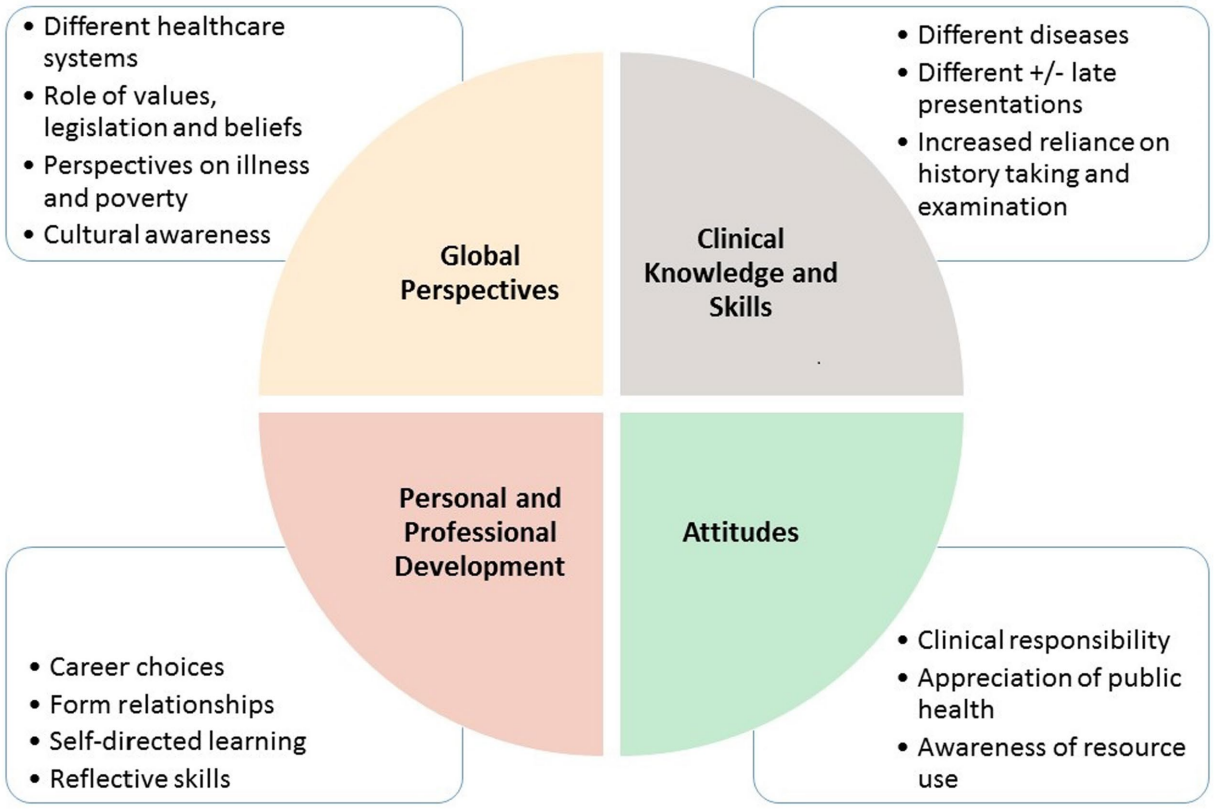

FIGURE 1
Values used to categorize the students' experiences as they participate in international electives for health professional students.

3.4. Students' learning experiences in the GEMx regional elective exchange program in Africa

About 62.6% ($n = 67$) rated their experience to be 4 which meant good on a scale of 1–5. For the vast majority of students 98.1% ($n = 105$), it was their first time participating in IEs, and 95.5% ($n = 102$) agreed that they would not have had the opportunity without the GEMx regional elective exchange program. Only a little over a quarter of the students 28.0% ($n = 30$) earned a credit/grade for their elective placement. The mean cost of the electives per student was $1,275 (SD ± $1076) USD.

All students 107 ($n = 100\%$) reported to have gained knowledge that they considered applicable in their home countries as shown in Table 4. Regarding personal and professional development, 43.4% ($n = 46$) of students reported to have formed valuable professional networks and relationships to advance their career paths. In the area of obtaining clinical knowledge and skills, almost 60.0% ($n = 64$) reported to have enhanced their clinical skills and learned various procedures and 26.2% ($n = 28$) expressed appreciation of the need for increased reliance on history-taking for a more accurate disease diagnosis. Close to two-thirds of the students, 63.6% ($n = 68$) recognized and appreciated the differences and similarities with healthcare systems in their home countries. More than a third of the students 34.6% ($n = 37$) realized the effect of culture on health outcomes. About 44.9% ($n = 48$) reported willingness to advocate for positive change in clinical practice in the specialties they were placed in their home countries.

4. Students' satisfaction with host institution during the GEMx regional elective exchange program in Africa

Students were asked to report on their satisfaction with their orientation and stay at the host institution (see Table 5). Options included very dissatisfied, dissatisfied, satisfied, and very satisfied. At the time of data analysis very dissatisfied and dissatisfied were categorized as dissatisfied while satisfied and very satisfied were categorized as satisfied. In general, responses were skewed in the direction of high satisfaction. Table 5 shows the distribution of satisfied participants in the various domains at the host institution.

5. Discussion

The GEMx regional elective exchange program enabled learners to gain enhanced perspectives on the health systems and disease burdens in Africa. Students were able to gain clinical knowledge and skills that could be applied in their home countries and enhanced personal and professional development skills. GEMx regional elective exchange program created an opportunity for African students to have more affordable international elective experiences without going to a

TABLE 1 Institutional networks with participating institutions location and distribution of student mobility during the pilot GEMx Africa regional elective exchange program (*N* =107).

Network	Institution	Country	Outgoing students (*n* =107)	Incoming students (*n* =107)
Afrehealth[1] (MEPI)[2]	University of Zimbabwe	Zimbabwe	7	13
	Kampala International University	Uganda	5	0
	Jomo Kenyatta University of Agriculture and Technology	Kenya	7	0
	Makerere University College of Health Sciences MEPI	Uganda	9	6
	University of KwaZulu Natal	South Africa	2	11
	Kwame Nkrumah University of Science and Technology	Ghana	3	1
	University of Zambia MEPI	Zambia	4	0
	Kenyatta University	Kenya	4	10
Afrehealth (NEPI)[3]	Makerere University College of Health Sciences	Uganda	4	0
	Ekwendeni College of Health Sciences	Malawi	7	9
	Muhimbili University of Health and Allied Sciences (MUHAS)	Tanzania	6	11
	Lusaka School of Nursing and Midwifery	Zambia	6	8
	Kamuzu College of Nursing	Malawi	6	0
COECSA[4]	University Teaching Hospital -University of Zambia	Zambia	2	1
	Rwanda International Institute of Ophthalmology	Rwanda	0	0
	Mbarara University of Science and Technology	Uganda	4	1
	University of Nairobi	Kenya	1	2
	Lighthouse for Christ Eye Centre	Kenya	0	3
South to south initiative under the University of Dundee	Makerere University, College of Health Sciences, Dept. of Family Medicine	Uganda	5	2
	University of Malawi	Malawi	4	9
	University of Rwanda	Rwanda	2	4
	University of Witwatersrand	South Africa	7	4
EAHPEA[5]	Mekelle University	Ethiopia	4	8
	Makerere University	Uganda	4	4
	Omdurman Medical University	Sudan	0	0
	Jimma University	Ethiopia	0	0
	Mbarara University of Science and Technology	Uganda	4	0

[1]AFREhealth, African Forum for Research and Education in Health.
[2]MEPI, Medical Education Partnership Initiative.
[3]NEPI, Nursing Education Partnership Initiative.
[4]COECSA, College of Ophthalmology of East Central and Southern Africa.
[5]EAHPEA, East African Health Professions Educators Association.

high-income country. The details of what worked well and the strengths and weaknesses of the models used to develop the program including the lessons learned have been published in another paper (Nawagi et al., 2022). This paper focused on the student experiences.

TABLE 2 Profile of student participants (*N* =107).

Variable	Frequency, *n* percentage (%)
Level of training	
Undergraduate	100 (93.5)
Postgraduate	7 (6.5)
Student discipline	
Medicine	68 (63.6)
Nursing	34 (31.8)
Pharmacy	4 (3.7)
Laboratory medicine	1 (0.9)
Elective duration	
2 weeks	4 (3.7)
3 weeks	3 (2.8)
4 weeks	95 (88.8)
8 weeks	5 (4.7)
Student's networks association	
AFREHEALTH MEPI	42 (39.3)
AFREHEALTH NEPI	28 (26.2)
EAHPEA	12 (11.2)
COECSA	7 (6.5)
South to South	18 (16.8)

Although this program did not aim at addressing any Sustainable Development Goals (SDGs), it reflects Sustainable Development Goal (SDG) 17which promotes the triangulation of partnerships for sustainable development by 2030 [United Nations (UN), 2015]. This goal (SDG17) postulates the need for partnerships from various global regions with a North-to-South, South-to-South, or a combination partnership model to advance initiatives for development, shared learning, and leverage resources similar to this study's context. ECFMG, a USA-based organization from the north, provided substantial financial investment and leveraged technology through its web-based application system, and an African coordinating center to manage and coordinate the GEMx regional elective exchange program utilizing a South–to–South model, thus promoting transferable knowledge sharing for sustainable development and practice among the future health workforce. In fact, this was the first time for almost all the students to participate in IEs. Most of the students mentioned they would not have had the opportunity to gain an elective placement outside their home country without the GEMx regional elective exchange program in Africa. These findings show a significant gap in global exposure for African students through IEs, compared to their counterparts from high-income countries (Olu et al., 2017).

The GEMx regional elective program in Africa helped facilitate a South-to-South model, i.e., mobility within low and middle-income countries in Africa. This resulted in affordable elective costs, i.e., on average, $1,275 for all expenses for 4 weeks compared to $5,000 or higher for other comparable IEs taken in northern America (Amopportunities.org, 2019). The program created an opportunity for African students to have more affordable international elective experiences without going to a high-income country (Bozinoff et al., 2014; TIMS, 2019).

While there was elective diversity in this study with over 18 elective specialties, most of these electives were clinical, with only one in public health (Social Medicine). This was because the vast majority

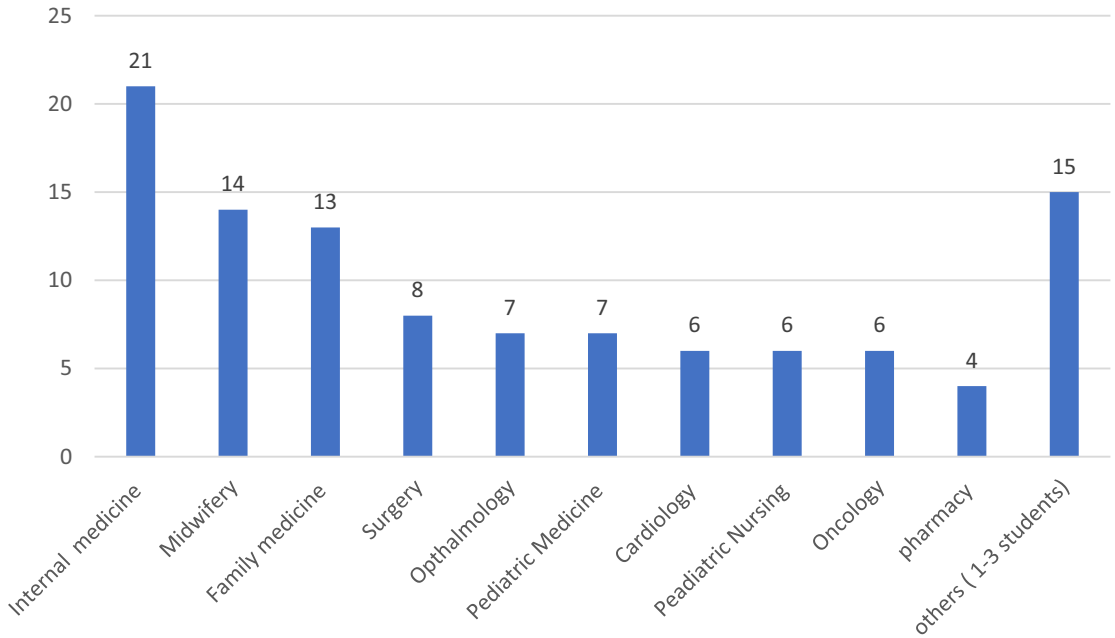

FIGURE 2
Electives specialties and student enrollment (*N* =107).

TABLE 3 Student's participation in elective learning activities (N =107).

Variable	Frequency, *n* percentage (%)
Collecting patient data/history taking	
	106 (99.1)
Course seminars	
	106 (99.1)
Ward meetings	
	107 (100)
Command of language skills	
	103 (96.3)
Observing	
	107 (100)
Clinical examination	
	105 (98.1)
Performing procedures	
	7(6.5)

of schools offer clinical electives, and mainly medicine, nursing, and pharmacy students were selected to participate in the program. This scenario can be compared to multiple incidents where many international electives are usually clinical in the region and globally (Neel et al., 2018). A similar occurrence is further indicated in a study among Saudi Arabia students who went for electives in other countries with the majority going for clinical electives (Neel et al., 2018).

Globally, efforts are being made in health professions education to achieve equity with the ultimate goal of producing a competent future health workforce with exposure to various or similar disease burdens in different settings (Beaglehole and Bonita, 2010). In this pilot study, all students reported gaining knowledge and skills that are applicable and transferable to their home country. This is because they were exposed to systems and disease trends within the same region (Africa). Flinkenflögel et al. (2015) conclusions are similar in that Rwandan family medicine residents were able to achieve their learning objectives and gained knowledge applicable to their home country during a South African family medicine elective (Flinkenflögel et al., 2015). However, the study was quantitative with a sample size of only five residents being studied for their learning outcomes (Flinkenflögel et al., 2015). Our study is one of the few large studies using a quantitative approach in Africa to document learning experiences in regional elective programs among health professional students and thus, strengthens the argument for the importance of regional elective programs in health professional training. IEs experiences, outcomes, and their impact are widely documented among medical students (Law and Walters, 2015). Our study is one of the few that has documented experiences with a multidisciplinary representation from medicine, nursing, pharmacy, and laboratory medicine coupled with undergraduate and postgraduate experiences in Africa.

Students participated in learning activities that include clinical examinations, observation of procedures, ward rounds, history taking, and course seminars among others. These are similar learning activities that students in high-income countries are exposed to when they go to low and middle-income countries for IEs (Kumwenda et al., 2014), and when a few students from low and middle-income countries go to high-income countries (Abedini et al., 2014). A caveat to note is that many of the students were not able to perform clinical procedures independently simply because they were undergraduate students and not ethically eligible to independently perform procedures. However, all those eligible to practice, i.e., the ophthalmology postgraduates performed procedures because they were eligible for temporary practicing licenses for the duration of their elective upon arrival to their host institution. This exhibits another strength of the GEMx regional elective exchange program in Africa which provided opportunities for hands-on clinical training to enhance skills learning for postgraduate students, unlike the South-to-North electives that are largely observer ships (Abedini et al., 2014; Amopportunities.org, 2019).

While electives are very common in the medical curriculum for students in high-income countries (Law et al., 2013), this is not the case for many African students. More than three-quarters who participated in this program did not gain credit or grades for their elective and utilized their semester break to take the elective. Given the learning experiences gained during a regional and international elective placement, African health professional institutions may want to consider adding electives to the curriculum that enable students to select IEs. Currently, only a few institutions like Makerere University (MakCHS, 2019) and the University of Witwatersrand (University of Witwatersrand Johanesburg, 2019) among others, have electives as part of their medical curriculum and allow students to take IEs.

From this study, we learn that the regional elective exchange model enabled students to obtain learning experiences similar to those obtained by students who participate in the North-to-South elective programs (Kumwenda et al., 2014). Furthermore, participants in this study describe positive attitude change in participation in regional (South-to-South) electives which is similar to students who went for the North-to-South electives (Stone et al., 2022). This is further indicated by almost half of the students in this study who mentioned that they would advocate for positive change and implement better practices back home. In this study, we used the values of IMEs developed by Dowell and Merrylees (2009) to report and analyze the student experiences. From the literature, under the value of global perspectives, specifically cultural awareness, and integration, students who participated in the North-to-South electives have often reported difficulties (Kumwenda et al., 2014). This is often referred to as cultural shock, which is an occurrence where one finds difficulty in integration when in a setting they are not familiar with Mitha et al. (2021). In the South-to-South electives, given exposure to almost similar settings, integration and the value of global perspective in relation to cultural awareness and integration just like in this study are often easily navigated which could be a strength. Nevertheless, the values of IMEs developed by Dowell and Merrylees (2009) have been used by other studies globally and in Africa (Daniels et al., 2020) to report student outcomes during international electives qualitatively and have been useful in widening the lens of the analysis of the student's experiences. This study through its results section attempts to report the findings quantitatively which add validity and strength to the IMEs values developed by Dowell and Merrylees (2009).

The pilot GEMx regional elective exchange program in Africa confirmed the importance of regional elective programs in addressing the existing gap in international exposure for African health professional students. Upon completion of the pilot, seven more institutions were added to the various networks, and a new

TABLE 4 Students self-report of learning experiences in the GEMx regional elective exchange program in Africa (*N* =107).

Learning experiences	Frequency, *n* percentage (%)
Personal and professional development	
Career choices	9 (8.4)
Formed professional relationships/ networks	46(43.4)
Gained self-directed learning skills	5(4.7)
Gained reflective skills	29(27.1)
Enhanced communication skills	7(6.5)
Resilience	1(0.9)
Gained teamwork skills	10(9.3)
Clinical knowledge and skills	
Different disease management	7(6.5)
Enhanced skills/learned various procedures	64(59.8)
Increased reliance on history-taking and examination	28(26.2)
Enhanced ability for disease diagnosis at early or late presentation	8(7.5)
Global perspectives	
Appreciating the differences and similarities in health care systems from that back home	68(63.6)
Cultural awareness and its Impact on disease outcomes	37(34.6)
Role of Values and Legislation	2(1.9)
Attitudes	
Advocate for positive change in clinical practice back home	48(44.9)
Articulate skills and perform more efficiently	46(43.0)
Appreciated the expertise and better system back home	5(4.7)
Engage more in research	4(3.7)
Make a comparison with home and host country inpatient management	4(3.7)

TABLE 5 Student Satisfaction with Host Institution during Regional Elective Placement in Africa (*N* =107).

Host institution satisfaction	Frequency of satisfied, *n* percentage (%)
Expectations communicated	
	99(92.5)
Housing	
	100(93.5)
Travel accommodation	
	100(93.5)
Learning about the host institution's culture	
	96(89.8)
Learning host institution policies	
	95(88.8)
Safety precautions	
	99(92.5)
Emergency plans	
	95(88.8)
General elective information	
	100(93.5)
Review/obtaining additional elective documents	
	104(97.2)
Adequate faculty supervision during the elective	
	101(94.4)
Communication with the assigned supervisor	
	99(92.6)
Opportunity to voice challenges	
	101(94.4)

institutional network called the College of Pathology for East Central and Southern Africa (COPECSA) was added in 2019. By the end of 2019, a total of 199 electives had been offered to students. Due to COVID-19 that caused hardships in physical mobility, the program has continued to run with a changed virtual interprofessional education approach in partnership with AFREhealth. From 2020 to date, 125 students have participated virtually using country-specific case studies. Funding for the virtual elective program is being provided from the AFREhealth NIH grant while the physical mobility continuity is still going to be funded using the ECFMG challenge grant with a focus on clinical exchanges and is expected to run again in 2024.

In terms of limitations, it is essential to note that this pilot study reports the experiences of immediate outcomes after the student's elective completion and not the long-term impact. However, the findings of the survey were used to explore in-depth students' experiences based on responses to the open-ended questions. This study's objective did not include any relationships between the student's experiences and their characteristics which may be crucial in affecting the student's general experiences during the elective placements. However, the students who were included were all those already in their clinical years of training in the various disciplines which enabled familiarity with the clinical and community settings where most of the international electives take place. This study did not collect baseline data on the knowledge, attitudes, and skills of program participants but, instead, only collected post-program data, making a change in these variables impossible to determine. A longitudinal study to establish the long-term transformative change is crucial and integral to assessing the impact of the electives on students' medical education, careers, attitudes, global perspectives, and clinical skills. Furthermore, an impact study with a rigorous longitudinal study design that systematically examines elective participation outcomes and their relationships with the student's characteristics is vital.

6. Conclusion

The outcomes of this study support the fact that the GEMx regional elective exchange program in Africa provided a useful platform to enable health professional students to gain enhanced global perspectives in health, acquire clinical knowledge and skills applicable to their home country, enhance personal and professional development, and promote positive attitude change in various health care delivery approaches.

Data availability statement

The original contributions presented in the study are included in the article/Supplementary material, further inquiries can be directed to the corresponding author.

Ethics statement

The studies involving human participants were reviewed and approved by Institutional Review Board (IRB) of Euclid University, School of Global Health, and Bioethics an intergovernmental and treaty-based institution under the United Nations Treaty Series 49006/49007 (Reference: IRB-2019-LTR-0705). The patients/participants provided their written informed consent to participate in this study.

Author contributions

FN led the implementation of the program, analyzed data, and developed the first manuscript. AI, JS, and SY assisted in manuscript preparation. SM provided the oversight role and guidance in all steps of the manuscript development. All authors contributed to the article and approved the submitted version.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Supplementary material

The Supplementary material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/feduc.2023.1181382/full#supplementary-material

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Cultivating critical consciousness through a Global Health Book Club

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Introduction: Central to public health practice is mindfulness and intentionality toward achieving social justice and health equity. However, there is limited literature published on how educators are integrating these concepts into their curricular, pedagogical and instructional efforts. The goal of this study was to leverage the pluralistic views, social identities, and demographics within the classroom to explore the effects of introducing a Global Health Book Club (GHBC) assignment focused on identity of culture, equity, and power. We also sought to explore the use of first-account narratives illustrating the human experience as an instructional strategy to cultivate an empathic understanding of global health threats, while fostering critical consciousness toward one's positionality within macro-level contexts. Finally, students were encouraged to reflect on their lived cultural experiences and engage in open and authentic dialogue with their peers.

Methods: We implemented a four-week GHBC assignment within an undergraduate global public health course. At the conclusion of the GHBC, students engaged in a reflective Individual Analysis Paper, which captured students' perspectives on their cultural values and traditions, how these views shaped their understanding of their book, and evaluate whether their global perspective had changed as a result of the assignment. Thirty-one students consented to have their Individual Analysis Paper downloaded and de-identified for analysis. Student responses were analyzed using inductive thematic analysis procedures.

Results: Through our analysis, six themes, with several coinciding categories, were identified as salient. The themes include Demonstrated Empathy, Personal Reflection and Growth, Personally Inspired, Immersive Learning Experience, Broadened Perspective, and Provoked Emotion.

Discussion: Our findings support that a GHBC assignment is a viable and effective mechanism for engaging students in critical reflection, critical motivation and critical action. In cultivating a learning environment that promotes student-centered learning and active participation, students exemplified agency in their own learning. This work can serve as an exemplary model for other public health educators to engage students in reflective-based assignments regarding their positionality and critical consciousness. By utilizing frameworks conceived out of antiracism, diversity, equity, and inclusion, our work presents an innovative activity in engaging students in decolonization efforts within global public health practice.

KEYWORDS

global health, critical consciousness, instruction, intersectionality, decolonization, higher education, qualitative research

Introduction

Social justice and health equity continue to become more central within public health practice (DeBruin et al., 2012; Hahn and Truman, 2015; Williams et al., 2019; Subica and Link, 2022; van Kessel et al., 2022). However, they are often omitted within current curricular and pedagogical efforts. There are several reports of social justice-based theoretical frameworks that serve as underpinnings for course development (Faloughi and Herman, 2021; Crawford et al., 2022), but limited published literature exists on individual assignments within public health coursework that engage students with concepts of health equity and social justice. Other health-related fields elucidate how including content on health equity (Braun et al., 2020; Denizard-Thompson et al., 2021; Bunting and Benjamins, 2022; Recto et al., 2022) and social justice (Hellman et al., 2018; Hughes et al., 2022; Shahzad et al., 2022) has not only improved students' understanding of the social determinants of health but also contributed to providing impartial care for vulnerable and/or marginalized populations. Consequently, through intentionally integrating culturally responsive and culturally relevant pedagogies within public health education, we can train the future public health workforce to engage with and practice social empathy and holistic community advocacy.

One mechanism identified within other fields to initiate social change and transformative processes among adult learners is critical consciousness (Diemer et al., 2016; Jemal, 2017). Freire's (1970) theory of critical consciousness (CC) aims to promote a learning environment in which individuals acknowledge both their own societal status as well as the status of others in order to enact actions that improve everyone's situation. CC allows learners to reflect upon their awareness of historical, institutional, and structural oppression, perceived capacity, and their ability toward addressing these systems of oppression (Jemal, 2017). CC embodies three constructs that are simultaneously intersecting yet independent of each other: critical reflection, critical motivation, and critical action (Watts et al., 2011). This paper will focus primarily on critical reflection due to the structure of the assignments provided both as a group and individual reflection as well as the limited time to measure follow-up actions. Critical reflection is defined as the metacognitive process of finding one's place in the world through critical analysis of self and society (Diemer et al., 2016; Jemal, 2017). CC, specifically critical reflection, is not a one-size-fits-all transformative experience wherein everyone recognizes their positionality and privilege—quite the opposite. It is through individual lived experiences that range from compounded marginalized social identities to relative privilege within current and historical sociocultural contexts (Diemer et al., 2016). While the CC framework was originally designed for marginalized populations to better understand their positions in society so as to create change, more research is emerging that incorporates those who have some aspects of privilege so that they may also critically reflect and contribute to societal transformation. While studies have demonstrated that educators in the field of public health who are familiar with critical pedagogy can effectively improve students' ethical consciousness (Mabhala, 2013; Maker Castro et al., 2022), there is limited evidence on its translation into public health coursework. Likewise, recent attention has been placed on critical consciousness-raising as a medium to improve health literacy and related outcomes (Sykes et al., 2013), highlighting the need for future public health professionals to be educated on the principles of critical consciousness and become more globally aware of the problems impacting one's health.

One strategy to raise critical consciousness is through the use of an intersectionality approach, in which people acknowledge how social constructs and systems of inequality create unequal power dynamics, thereby leading to disadvantaged populations (Nichols and Stahl, 2019). Born from the civil rights movement, the term intersectionality was coined by Crenshaw (1989), a legal scholar, meant to underscore the multidimensionality of marginalized populations, specifically Black women. Particularly, intersectionality seeks to examine how social constructs interact with each other so that individuals can apply their understandings to bring about social change (Bond, 2021). When introducing an intersectionality approach into the classroom, it is recommended to acknowledge the drivers of varying lived experiences to better understand an individuals' position or stance (Cho et al., 2013). Intersectionality approaches in post-secondary education settings have aided students in their ability to think critically by considering the perspectives of others and act upon issues facing marginalized groups (Potter et al., 2016; Bi et al., 2020). Specifically, in health-related fields, there are numerous social factors such as race, income level, and sexual identity which can contribute to one's health outcomes and further inequities (Pickett and Wilkinson, 2015; Gadson et al., 2017; Hsieh and Shuster, 2021).

To elicit conversations grounded in critical consciousness and intersectionality within a global context, educators must create environments where students feel empowered to challenge preconceived notions. Diverse learning environments encourage students to share aspects of their culture and individual lived experiences through means such as diversified curricula and learning materials (Otten, 2003; Tienda, 2013). One approach to creating an educational environment where discourse on social identity and individual perspectives can occur is through a book club. Book clubs have been demonstrated to empower students to discuss more personal matters while also creating an opportunity for them to engage in perspective-taking where the students gain a better understanding of others' situations (Addington, 2001; Lewis, 2004; Henderson et al., 2020). As such, book clubs can act as an effective instructional tool for educators to foster critical consciousness where students consider how social factors impact the health of people on a global scale. Subsequently, a book club assignment was used for an undergraduate global public health course to encourage critical consciousness and perspective taking among a diverse group of students.

The goal of this study was to leverage the pluralistic views, social identities, and demographics within the classroom to explore the effects of introducing a global health book club focused on identity of culture, equity, and power. This study includes students from a cadre of different marginalized and privileged backgrounds wherein students must work in groups to produce communal reflections on a global health-based book as well as an individual reflection paper describing their own position from an intersectionality perspective. We seek to explore the use of first-account narratives illustrating the human experience as an instructional activity (or approach) to cultivate an empathic understanding of global health threats, while fostering critical consciousness toward one's positionality within larger social, political, and global contexts.

Materials and methods

Global Health Book Club assignment

The Global Health Book Club (GHBC) assignment was embedded within an undergraduate, upper division (3000-level) global public health course at a large public university in the southern United States. This course permitted students of any major to enroll, however, it was composed primarily of public health and health science students. Within this course, students learned about various global health threats, strategies to promote locally-derived solutions, and described how social, economic, cultural, environmental, and institutional factors can influence key global health issues. Toward the middle of the 15 week semester, students were introduced to the GHBC assignment and were given seven books to choose from (Appendix A). Students were permitted to choose their own book and were given a deadline to provide the title, otherwise the instructor would choose for them. Once each student had chosen a book (posted within a Discussion within the course Canvas page) they were put into groups. The instructor chose books that addressed the larger ideas of the course: culture, equity, power, influence. The instructor was a qualified individual to moderate and select appropriate books due to being an experienced global health researcher and practiced educator. As such, several of the books touched on uncomfortable, and sometimes graphic, content; which made allowing the students to choose their book essential as well as promoted autonomy. Most books employed a strong narrative style, "human story" approach and addressed meso and macro perspective, while largely telling the story through the experiences of individuals. During the GHBC, it was emphasized that students should focus more on the story of the individual, appreciate their struggle, and compare and contrast their own identity with the author's. Due to the large number of students (96 total) several groups shared the same book.

Prior to launching the GHBC, students were explained the purpose of this assignment within Appendix A. These instructions were shared to set the groundwork for potential discourse within groups as well as how to navigate these discussions with respect and thoughtful language. Students were encouraged to begin reading their book prior to the Spring Break recess; however, this was not a requirement. The GHBC was scheduled to last 4 weeks with each week having a short prompt (Appendix B) that the groups must submit as a whole, as opposed to individually. The weekly prompts were meant to incite broad discussion based on concepts presented within the book, while also tying it to global health issues. At the onset of the GHBC there was time set aside (roughly 30 min) at the end of each class to allow groups to discuss what they had read, share their interpretations, and work on the weekly prompt. The instructor intentionally did not engage with students while in their groups to encourage student-led conversations to organically occur. The culminating group assignment (Appendix B) included creating a trailer for the book each group read. These trailers allowed for creativity in sharing what the group perceived as major points within their book, while demonstrating respect for the protagonist's story. The final individual assignment (Appendix C), and the source of data for this project, was the Individual Analysis Paper (IAP) that captured each student's perspective on their own cultural values and traditions, how these views shaped their understanding of their book, as well as other content to demonstrate whether their global perspective had changed or not as a result of the assignment.

Data collection

Upon the completion of the course, all students were sent an email indicating if they would consent to their Individual Analysis Paper being used within a research study. Of the 96 students who were enrolled in the course, 31 consented to participate. Once consent was obtained, the IAPs were downloaded from Canvas and de-identified for analysis. Ethical approval was obtained for this study on May 23, 2022 by the University of Florida's Institutional Review Board (IRB202201186).

Data analysis

Student responses were analyzed using an inductive thematic analysis approach (Patton, 1990; Braun and Clarke, 2006; Kiger and Varpio, 2020). The analysis process began with two researchers who each independently coded line-by-line using NVivo 12 Plus (Zamawe, 2015). Following the completion of this open-coding period, the two researchers began a negotiation period in which they compared each of the codes that they developed independently across the entirety of the data to reach a final consensus (Castleberry and Nolen, 2018). From there, the two researchers identified like-codes which were then grouped into labeled categories. Following the negotiation, themes and categories were presented to the larger research group where they were consolidated further based on characteristics of a specific phenomenon. Once the larger research group agreed upon final themes and subthemes, the two researchers operationally defined the most salient themes and categories to directly reflect the content from which they represent. Further, one outlier which was not condensed into the salient themes and subthemes included the concept of balancing personal cultural ties. The thematic analysis procedure employed provided the study with an inductive and systematic approach to considering the phenomena present in the data (Kiger and Varpio, 2020). Further, in line with thematic analysis principles, themes were not developed based upon the frequency of presentation but rather emphasized through the identification of commonalities continually present in the text.

Results

Thirty-one student papers were analyzed of the 96 students enrolled in the undergraduate Global Health course. Of the 31 students, 5 (16%) were male and 26 (84%) were female. Various races and ethnicities were represented including: 16 (52%) White, non-Hispanic; 6 (19%) White, Hispanic; 7 (23%) Asian; 1 (3%) Black and 1 (3%) not specified. A majority of students were public health or health science majors (88%), one (3%) Anthropology major, one (3%) Psychology major, and two (6%) Microbiology and Cell Science majors. Out of all of the book options listed in Appendix A, *Worries of the Heart* was not represented within this sample due to the small number of students who chose it as their book for this assignment.

Six themes were established including: Demonstrated Empathy, Personal Reflection and Growth, Personally Inspired, Immersive Learning Experience, Broadened Perspective, and Provoked Emotion. The two coders also established eleven categories: Considered Author or Protagonist's Perspective, Similarities Transcend Borders, Self-Reflection, Understood Personal Limitations or Biases, Learned Importance of Personal Awareness and Practice, Inspired by Authors or Protagonists, Inspired Personal Intention or Action, Expanded Global Health Knowledge, Gained Insight on Significance and Severity of Global Health Issues, Difficult to Relate, and Grateful for this Learning Experience. A visual representation of the themes and subthemes is displayed in Figure 1.

Demonstrated empathy

This theme was characterized by student's ability to empathize with situations outside of the context of their own life. Demonstrated empathy was further delineated into two categories: (1) considered author or protagonist's perspective and (2) similarities transcend borders. Students reflected on the impact of war and its contribution to personal resilience. For example, in reading *The Last Girl* students also considered the significance of religious identity when one student states, "As someone who is not very religious this was beautiful to read about and made it all the more devastating when they were persecuted by ISIS. Additionally, I thought it was interesting, but also heartbreaking, how many of the girls were terrified they would not be accepted by their families due to the sexual abuse they had experienced because sex before marriage was prohibited in their religion." Additionally, students reflected on being inspired by the resilience of the author or protagonist as exemplified as a student described, "I found it beautiful how Achak was living through events that I could never fathom going through, and he was still looking forward to small things in his life that bring him happiness."

Considered author or protagonist's perspective

In many cases, students directly sympathized with the author or protagonist's perspective as well as learned from their vantage points, "I imagined myself as Nadia and losing my virginity to a random man who I did not know nor love and how disgusted I would feel when looking at myself in the mirror." Further, by deeply considering these defining situations, students noted how it would have impacted themselves, "I have one older brother and one younger brother, both of which are old enough to have fallen in the category of those being executed."

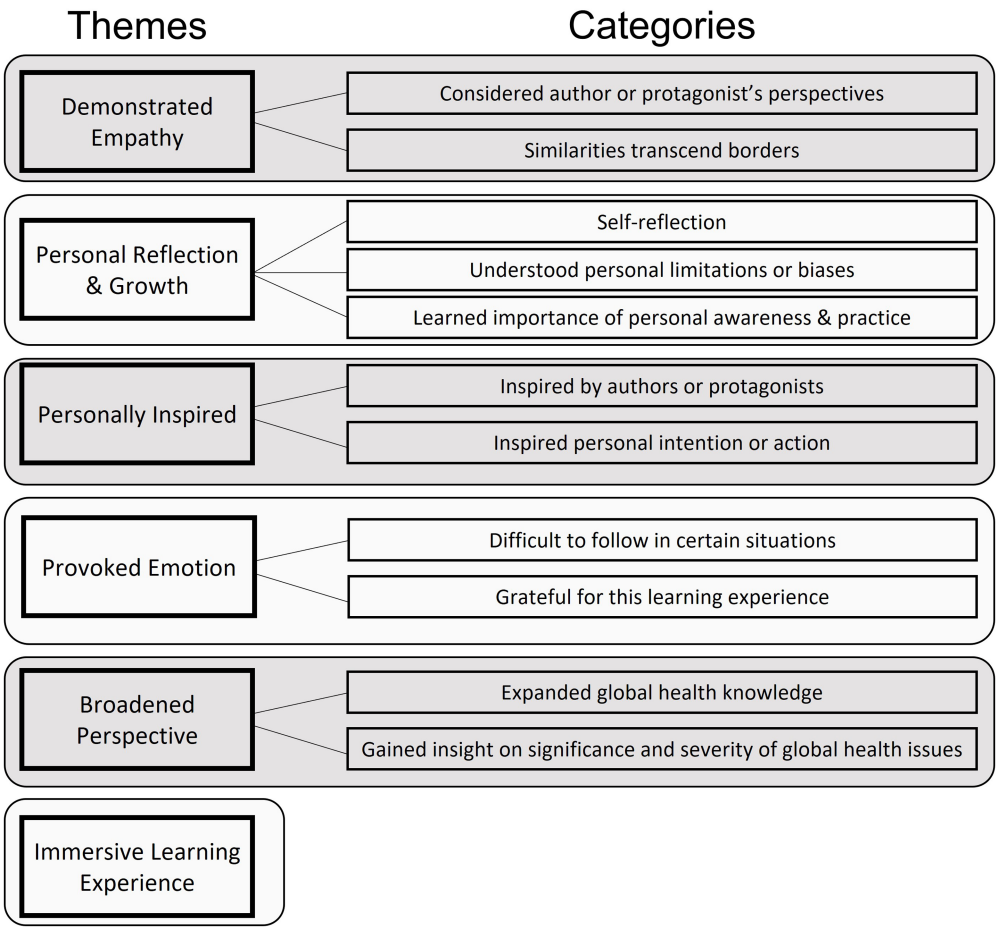

FIGURE 1
Classification of salient themes and categories.

Similarities transcend borders

Notably, students elaborated on how there were significant, unexpected similarities that they shared with the people in the texts which transcended across cultures. Similar experiences concerning identity and culture were prevalent amongst student responses, "Similar to the author, I have experienced identity conflict and partial erasure as I have attempted to balance my two cultural backgrounds and experiencing judgment from both sides as a consequence." In another regard, shared priorities were also evident, "Growing up with this family dynamic I felt a connection to Nadia's feelings of appreciation and the importance of family."

Students also considered ties and similarities across a wide spectrum of social identities such as religion and faith to sexuality and sexual orientation. Exemplifying the discussion of religion and faith, one student noted, "I was able to feel a connection to the main character, Valentino, as he talked about his faith throughout the book because, in many ways, it was similar to my own." Moreover, discussion of similarities relating to queer sexuality resonated with students, "I did resonate with the aspects of the book that discussed queer identity and coming to terms with your sexuality because this is something I have experienced as someone who identifies as bisexual."

Personal reflection and growth

This theme was characterized as realizations that the text instigated moments of reflection on personal perspectives as well as considerations of how these perspectives may develop. Personal Reflection and Growth was divided into three categories: (1) self-reflection, (2) understood personal limitations or biases, and (3) learned importance of personal awareness and practice. Students considered how publicized information is often limited and that often there is much more to learn in a global context, "I think that after reading *Last Girl*, I have become more cognizant of seeking out alternative perspectives on every story to become more insightful and aware of the whole picture." Additionally, by reflecting on personal beliefs or attitudes, students understood that action may be required for tangible, personal growth, "In this position of privilege I have, there is a clear responsibility to uphold human rights and be vocal when they are abused."

Self-reflection

Throughout the responses, students expressed personal introspection. In many cases, this form of reflection elicited recognition of one's personal privilege, "It reminded me that while the United States is by no means a perfect country, it is still important to be appreciative for the life many Americans are able to live." Students also expressed how considering the text allowed them to realize previous ignorance, "I realized that there are so many cultures, ethnicities, and ways people define themselves that I have no idea about." In addition, self-reflection allowed students to recognize new responsibilities, "I enjoyed reading this novel, and I plan to hold myself responsible for learning about intersectional experiences of Latine folk throughout the rest of my career to best serve as a culturally sensitive medical provider for patients from these backgrounds."

Understood personal limitations of biases

Students admitted in their responses that they experienced personal growth as they gained a greater cognizance of the impact of their disposition. More specifically, students noted limitations of lived experience or background, "I acknowledge that, as a white woman, I have had very different lived experiences than Anzaldúa and other women of color." Some students also noted how their personal experiences affected their understanding and interpretation of the text, "I think that my culture of being a citizen of the United States, a member of a military family, and a Christian affected my understanding of this book." Additionally, students discussed their limited prior global health knowledge as it pertained to the text, "I was completely ignorant to the entire war before reading this book."

Learned importance of personal awareness and practice

Many students reported that the text taught them the greater importance of personal awareness as it pertains to cultural competence and humility, "Participating in the Global Health Book Club taught me a lot about myself, the world, and the importance of cultural humility." In another regard, students also recognized the value of learning from people of another culture or of intersectional identities, "Throughout reading the novel, the most interesting aspects to me included learning about the author's perspectives and intersectional identities." The concept of intended practice was also expressed by students as they considered the importance of being a lifelong learner, "To be a lifelong learner and try to understand people's cultures more deeply is not only important for the field of global public health, but for everyone in the world to stop discrimination, genocide, murder, and crimes against humanity to improve on the overall health and wellbeing of everyone in this world."

Personally inspired

In many cases, students expanded on how the characteristics of the protagonists encouraged personal action from the readers. Personally Inspired was further divided into two categories: (1) inspired by authors or protagonists and (2) inspired personal intention or action.

Inspired by authors or protagonists

Characterized by students' acknowledgement of the influential nature of the author or protagonist in the story, students described that "it was inspiring to see the author herself rebel and encourage rebellion among fellow women to maintain their voice against the multiple systems of oppression they face." Notably, many students detailed how the resilience of either the author or protagonist inspired them, "the most inspiring part was their ability to pick themselves up and continue with their life." Students also noted that they drew inspiration from the ability of either the author or protagonist to draw happiness from life while experiencing trauma, "Achak's life was filled with so much trauma that it is amazing he stays so positive and motivated." As it pertained to the writing choices that the authors made, students noted being inspired by rooting intentional literary choices in one's own personal, cultural perspective, "Therefore, the author's choice to stay true to her linguistic roots and Mexican heritage is intentional, and it is not meant to be tailored to the reader's own

linguistic background. I kept this in mind while reading, and this made me appreciate the effect and the author's reasons for including this back-and-forth between languages."

Inspired personal intention or action

Students expressed that they were inspired by the text to take personal action in global health issues, "*Mountains Beyond Mountains*, has only increased my learning about different topics but furthered my passion to get involved with global health issues to help aid and improve the health of individuals on a global scale." In another regard, students considered how reading the text inspired the intention to emulate the morality of the protagonist or author when sharing, "I really admire Paul Farmer and I want to try to emulate his unending patience, kindness, intelligence, and moral motivation." Many students also reported that the text also compelled them to learn more from a global health perspective illustrated by one comment of "I hope to carry this attitude with me in the future by seeking out the experiences of others more often so that I not only stay educated, but also empathetic and aware of injustices happening around the world." Additionally, students often mentioned that the influential nature of the GHBC assignment inspired them to act with one student admitting that "Not only have I learned from the book, but the book inspired me to do more research about the civil war in Sudan." Finally, students recognized that their group discussion work surrounding the text also incited intention for personal action: "Hearing about their future goals of improving the health of populations helped me realize that I can do the same as a dietitian."

Immersive learning experience

Immersive Learning experience details students' encounters with the author's storytelling techniques and engagement with the dynamic nature of GHBC activities. GHBC assignments elicited student comments like, "I felt like I was fully immersed in 'her world' and was able to understand the implications of the attack more coherently and vividly due to her seamless storytelling." In addition to the impact of the authors ability to engage readers throughout the story, students also explicitly noted that the GHBC was made even more immersive due to dynamic group discussion which allowed group members "to share their personal interpretations of the book and compare them with the other people in the group."

Broadened perspective

Broadened perspectives included growth in personal global health perspective caused by a deeper understanding of situations as presented in the assigned readings. This theme was categorized into two subthemes: (1) expanded global health knowledge and (2) gained insight on significance and severity of global health issues. The broadening of students' perspectives was made evident throughout the GHBC assignments as students mentioned a contrast between their previous worldviews before and after completing their assigned reading. This was evidenced as one student notes, "my global perspective was quite narrow for most of my life. Throughout this course and through reading this book, I have been able to broaden my understanding of the experiences of people in countries outside of the United States."

Expanded global health knowledge

Expanding knowledge around global health issues was defined as the process of increasing insight into global health threats, systems, and history. In describing the book *Mountains Beyond Mountains*, she states, "I was able to grow in my knowledge about the global public health issues. I was extremely uneducated about issues such as affordable healthcare on a global scale prior to this reading, but was able to better grow and connect with these issues after completing this book. [The author] provides the reader with real-world situations that allow the reader to better connect and understand the issues being discussed within the book." Another student elaborated on the benefits of having a group dynamic to gain knowledge from different perspectives, "[The assignment] challenged the readers to dive deep into global public health issues and apply new knowledge each week with the book club assignments. Working with others made the experience even more beneficial, as group members were able to share their personal interpretations of the book and compare them with the other people in the group."

Gained insight on significance and severity of global health issues

Additionally, students shared the realization of the weight of global health issues through increased contextualization and awareness. One student noted that "this book helped me better understand the severity of disease other parts of the world experience." Furthermore, students also noticed who is disproportionately impacted by severe global health issues as a student mentioned that "reading this book and discussing our thoughts and reactions with my group members has definitely broadened my perspectives on global health events and experiences of vulnerable groups of people."

Provoked emotion

Provoked emotion consisted of experiences that solicited various reactions from GHBC participants. For example, a student described the difficulty in reading the assigned book as "it was very hard for me to read about how the girls were stripped of their agency and forced to serve men who used religion to justify their actions and the atrocities they committed." Provoked Emotion was divided into two categories: (1) difficult to follow in certain situations and (2) grateful for this learning experience.

Difficult to follow in certain situations

Throughout the GHBC assignments students mentioned the barrier to understanding the story due to the author's mode of developing the narrative. One student explained that "I found it quite difficult to gain the full perspective of each refugee's story, which was condensed down to only a chapter." When students lacked the contextual knowledge to further understand the story they described their experience as "hard for me to truly appreciate and relate to because religion was not a central part of my life when I was growing up." Ultimately students seemed confused by their inability to draw a personal parallel to the protagonists' situation as one student notes "while reading, at times it was hard for me to grasp and truly understand the events occurring throughout the book because I have never faced anything similar."

Grateful for this learning experience

Students explicitly commented on their appreciation of the knowledge and insight gained by participating in the GHBC. Specifically, as a student mentions, "I am grateful to have participated in this learning experience and for the discussions I was able to have with my group." Students also realized the value provided by the GHBC assignments as one student noted, "I'm so grateful for the opportunity to learn about these topics that I would have never took the time to learn if not for this book."

Discussion

Social justice and health equity are central to public health's mission and should be reflected within our educational and pedagogical practices as we train the public health workforce. Similar to how social justice response strategies have been developed within emerging and current public health work (DeBruin et al., 2012), a mindfulness and intentionality focused strategy toward employing social justice-based (Crawford et al., 2022), health equity-focused (Chandler et al., 2022), and critical pedagogically-grounded (Saunders and Wong, 2020) teachings should be at the center of public health education efforts. Unfortunately, there is limited literature available on public health curriculum and assessment that engage students with concepts of health equity and social justice. As such, this study implemented a Global Health Book Club (GHBC) assignment, grounded in theory of critical consciousness and intersectionality, to leverage the pluralistic views, social identities, and demographics within the classroom. Furthermore, this study explored the GHBC's effects on identity relative to culture, equity, and power. Through an inductive thematic analysis qualitative inquiry, we were able to identify several salient themes and subthemes that captured the undergraduate experience of engaging with an innovative and reflective learning assignment.

Within the development of the GHBC, an attention toward the theory of critical consciousness (Freire, 1970, 1976), but more specifically the stage of critical reflection, was at the forefront. Critical reflection describes developing "an awareness of both the historical and systemic ways oppression and inequity exist" (Diemer et al., 2021, p. 13). It requires an individual to not only develop an awareness, but to also potentially grapple with any previous, personal assumptions or biases they may have. Some of these may even directly conflict with the exposure to evidence of historical systemic and institutional oppression, thus catalyzing the onset of cognitive dissonance (Festinger, 1962). Interestingly, the onset of cognitive dissonance is reportedly followed by a state of resolution, where the individual seeks to ease feelings of discomfort or misalignment as quickly as possible. This aligns with our findings, as students engaged in critical reflection as evidenced through several recurring themes such as Personal Reflection and Growth and Broadened Perspective, but also through themes Provoked Emotion and Demonstrated Empathy which required an intraindividual investment and vulnerability (Bardi et al., 2009). Invoking an emotional response, and potentially a value shift, demonstrates the value of critical consciousness as an effective mechanism to engage students in transformative learning and promote openness to a variety of diverse experiences and populations.

However, there were instances where students noted it was challenging to identify with the events or protagonist within their book, as shown within the Provoked Emotion category, Difficult to Relate. By not having their own personal experiences to draw upon as a form of relatability, students expressed that they had difficulty understanding the experience or conceptualizing the full depth of impact on the protagonist's sense of being. This coincides with literature that states for learning to be significant, the content must personally affect the learner (Merriam and Clark, 1993). Without an underlying relatability, students may inadvertently struggle to connect with or fully value the experiences being shared. Consequently, a similar misalignment may be present with how our students may be able to relate and empathize with the communities they serve. The importance of developing a public health workforce that can understand, respect, and serve the problems of our communities cannot be overstated. As such, innovative teaching strategies have been employed to bridge the gap between student and community experience, alleviating some of the distress and difficulties students currently face when trying to relate to various populations (Campbell, 2016; Levin et al., 2021; Ingram et al., 2022). However, when implementing new teaching strategies and learning opportunities, we have to maintain a mindfulness to not perpetuate otherness principles between students versus community (Staszak, 2009), but highlight the mission of critical action or the "collective action to change, challenge and contest" inequities (Diemer et al., 2021, p. 13). This is particularly important as our results found students felt their similarities transcended borders, yet their differences caused ambiguity and confusion. This was most commonly expressed when students were not able to contextualize the centrality of a social indicator within one's values, beliefs, and behaviors. This being said, opportunities to self-reflect and critically engage ultimately allowed students to express an understanding of their personal limitations due to biases and learned importance of personal awareness and practice, potentially reducing the effects of not relating to one another.

Unexpectedly, our results demonstrated students' ability to transcend critical reflection and to also show elements of critical motivation and critical action. On more than one occasion, students expressed a moral commitment toward action induced by the inspirational onset of a protagonist's resilience or the author's behaviors, as depicted by the category, Inspired Personal Intention or Action. This greatly parallels critical consciousness's critical motivation stage, which is defined as "the perceived capacity or moral commitment to address perceived inequalities" (Diemer et al., 2021, p. 13). And though students' critical motivation was conceived out of the didactic accounts of adversity, there was also a salient reaction from many regarding the protagonists' ability to overcome such adversity. Seeing triumph and resilience in experiences of trauma and oppression was notably a source of validation or reaffirmation of their choice to go into public health and/or related health professions. Interestingly, resilience within student responses was often conceptualized as a product of the protagonist's experience rather than as a process of evolution and survival against adversity. Introducing resilience as a process rather than a product has shown to be intellectually and practically more productive (Joseph, 2015) and therefore should be an emphasis within framing community and personal experiences against adversity. In doing so, identifying aspects of individuals' and communities' strengths and successes may serve to be a powerful approach to public health intervention design, coalition building, and community capacity development (Trajkovski et al., 2013). In addition to protagonists' experiences, students drew

inspiration from the exemplary blueprints of behavior and leadership outlined by the author's public health efforts and personal experiences, particularly within *Mountains beyond Mountains* by Dr. Paul Farmer. Based in social learning theory and social psychology, behavioral modeling has shown to be an effective way for framing and engaging students in ideal behaviors (Khan and Cangemi, 1979). As such, utilizing an adjusted interpretation of modeling by presenting first account narratives of exemplary models within public health and global health allows students to learn and strive to imitate these behaviors and leadership qualities. This was again evinced through the category, Inspired Personal Intention or Action, where students noted specific attributes and actions to engage in to meet their future professional and service goals.

Furthermore, through this book club we created a learning experience by encouraging students to share ideas, topics, and readings for the course, as well as their lived cultural experiences to facilitate dialogue and discussion of areas that their book club may not cover. Students noted the benefit of not only engaging with the readings but with each other through the theme, Immersive Learning Experience, specifically detailing the advantages of dynamic group discussion as an instructional strategy. In cultivating a learning environment that promotes not only student-centered learning but active and critical participation, students were allowed to be agents of their own learning (Freire, 1970; Ahn and Class, 2011). Congruent with others' accounts of intentionally co-constructing knowledge with students, we found that students welcomed learning as a process rather than a tangible product such as assessment scores and grades (Ahn and Class, 2011). In doing so, the subjectivity of knowledge and value of lived experiences was realized among the student population. This idea fortifies other efforts within the public health field, such as Ford and Airhihenbuwa's (2010) social construction of knowledge and voice, both of which prioritize the perspectives of marginalized persons and alternative methodologies/epistemologies as valid and influential forms of knowledge. Utilizing group discussions within a book club assignment supported the assessment objectives of focusing on identity of culture, equity, power, and influence through examples of the human experience, while also encouraging students to create and foster authentic learning communities grounded in celebrating each other's diverse experiences.

Limitations

This study has potential limitations that should be considered in the interpretation of the results. First, this analysis is based on a limited number of student responses within an undergraduate restricted access program course. The specificity of the study population may not be generalizable to broad undergraduate populations. Second, only student responses in which the student agreed to have their response analyzed were included. This may present a volunteer bias that often accompanies a convenience sample. Having only students who volunteered for consideration may lead our results to only include individuals who had a positive experience with the activity rather than encompassing the entire student population. Furthermore, among the students who did volunteer, there was an underrepresentation of Black identifying students compared to the overarching course's composition. And lastly, by engaging in qualitative inquiry, there is the possibility of researcher bias. However, the study team utilized multiple, independent coders within the data analysis phase in an effort to reduce the risk of bias influencing the identified results.

Conclusion

This research is unique and novel since it contributes to limited scholarship around the intersection of public health practice and instructional strategies. Furthermore, this work can serve as an exemplary model for other public health educators of a theoretically grounded assignment to engage students in reflective-based discussion and writings regarding their positionality and critical consciousness toward health disparities, inequities and inequalities. Utilizing frameworks conceived out of anti-racist and diversity, equity, inclusion and antiracism, the instructional strategy outlined in our study presents one activity in engaging students in decolonization efforts within global public health practice. Prioritizing lived experiences, diverse perspectives, and authentic conversations, an effective and successful cultivation of an equitable learning environment was achieved. Furthermore, by introducing this approach within an undergraduate course, we have prefaced their future public health efforts with a mindfulness toward power, perspective, and privilege, as well as fostered a sense of agency for students to engage in collective action as future public health professionals.

Data availability statement

The datasets presented in this article are not readily available because data are student responses from a course assignment which may be identifiable as a whole based on semester of course, public records of enrollment, and unique experiences and identities shared within the responses. For the integrity of student confidentiality and anonymity, this data is restricted. Requests to access the datasets should be directed to SLC, sarahcollins@ufl.edu.

Ethics statement

The studies involving human participants were reviewed and approved by University of Florida Institutional Review Board. The participants agreed to participate in this study via electronic informed consent.

Author contributions

SLC and EW contributed to conception and design of the study. SLC also led data collection management efforts and wrote the discussion section of this manuscript. EW and SJC collaboratively wrote the background and introduction. EW also wrote the assignment description and data collection subsections of the Methods and Materials. SJC formatted the manuscript to comply with Frontiers in Education specifications. AR and AA conducted data analysis procedures and wrote the data analysis and results sections of

the manuscript. All authors contributed to the article and approved the submitted version.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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A global matchmaking web platform facilitating equitable institutional partnerships and mentorship to strengthen health workforce training capacity

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The critical human resources deficit in the healthcare sector in low-resource settings (LRS) has an overwhelming impact on health outcomes and disparities in growth and development of the global healthcare workforce. There is a lack of qualified trainers and mentors and this makes it challenging to connect existing capacity gaps with existing expertise and established programs. Through global health partnerships, training programs, and mentorship, individuals and institutions from around the globe can connect to share training resources and strengthen clinical and research capacity in LRSs. Global health partnerships focused on capacity building face many challenges including; unequal access to information about potential partners and training opportunities, a lack of transparency regarding each institutions training priorities, and inequity and absent reciprocity within global health partnerships that have disproportionate power division between high-resource and LRSs. This initiative, the Consortium of Universities for Global Health Capacity Strengthening Platform (CUGH-CPS) (CUGHCapacityBuilding.org), aims to empower institutions and individuals in LRSs to address these challenges and drive partnership engagement through avenues that are beneficial to the LRS agent needs and context by leading the prioritization of training capacity development across clinical and research domains. The CUGH-CPS helps to identify and create a platform for the dissemination of

training and mentorship needs from LRS institutions and share this information with the global community. This manuscript describes this new initiative officially launched to a global audience at the April 2023 CUGH meeting.

KEYWORDS

global health partnership, healthcare workforce, capacity building, institutional capacity, low-resource settings, CUGH

Introduction

An adequate and fairly distributed healthcare workforce is essential to achieving equitable access to healthcare services at the primary, secondary, and tertiary levels, ensuring Universal Health Coverage (UHC), and responding to the Sustainable Development Goals (SDG) (World Health Organization [WHO], 2016a,b, 2017a). Currently, the critical human resources deficit in the healthcare sector of low-resource settings (LRS) has an overwhelming impact on health outcomes globally (Dreesch et al., 2005; World Health Organization [WHO], 2016a). The 2016 Global Strategy on Human Resources for Health: Workforce 2030 projected a global shortage of 18 million health workers by 2030 (World Health Organization [WHO], 2016a). Recent findings, aided by the availability of improved data, illustrate a reduction in this global shortage estimate from 15.4 million in 2020 to 10.2 million in 2030 (Boniol et al., 2022). However, while there is improvement, the human resources for health crisis remains a pressing concern. In addition to shortages, there are considerable disparities in growth and development of the healthcare workforce globally. Contrary to other global regions, the World Health Organization (WHO) African and Eastern Mediterranean regions did not show improvements between 2013 and 2020, and projections remain stagnant into 2030 (Boniol et al., 2022). The WHO African Region has the highest shortage of healthcare workers. Thirty-six of the fifty seven WHO Member States globally facing a critical shortage of doctors, nurses, and midwives were from the African Region (World Health Organization [WHO], 2021). While the SDGs require 4.5 health workers per 1,000, the African Region has an estimated average of only 1.55 per 1,000 population (World Health Organization [WHO], 2022a,b). The WHO African Region workforce shortage is estimated to reach 6.1 million by 2030 (World Health Organization [WHO], 2017b). In addition, there is an uneven distribution of workforce by country within Africa, ranging from 0.25 health workers per 1,000 people (Niger) to 9.15 per 1,000 (Seychelles) (World Health Organization [WHO], 2022b).

At the heart of the problem is a lack of qualified trainers and mentors as well as the challenge of connecting existing expertise and established training programs to areas and individuals with identified training capacity gaps (The Academy of Medical Sciences, 2017; Consortium of Universities for Global Health, 2020; The Sustaining Technical and Analytic Resources (Star) project, 2020; Sustaining Technical and Analytic Resources (Star), 2020a). Global health partnerships, training programs, and mentorship are common ways through which individuals and institutions can connect and share training resources in order to strengthen clinical and research capacity in LRSs (The Academy of Medical Sciences, 2017). In 2019, the Consortium of Universities for Global Health (CUGH) led an initiative which included a structured review (including profiling and researching potential partners) and analysis of capacity needs for academic partnership in global health, followed by development of a capacity assessment process for enhanced knowledge sharing (The Academy of Medical Sciences, 2017; Consortium of Universities for Global Health, 2020;Sustaining Technical and Analytic Resources (Star), 2020a,b). In the same year, CUGH piloted a web-based platform aimed at connecting institutions for capacity strengthening partnerships. During the pilot phase there were 152 unique registrations from 34 different countries. The US had the most partnership opportunity listings (36.8%) followed by Nigeria (9.2%), South Africa (8.6%), Uganda (5.3%), Ethiopia (4.6%), and Pakistan (4.6%). Low- and lower-middle-income countries represented 82.4% of all countries. The countries represented spanned across all World Health Organization regions. Of the 98 listings that specified a technical domain: medicine accounted for 53.1% and nursing had 21.4%. We were unable to track partner matches on the platform, creating challenges in understanding the full impact of the database. Registered users of this pilot initiative were surveyed and the end-user feedback and impact of the pilot initiative is reported in a separate article (Jose et al., under review).[1] This pilot initiative has informed the further development of this platform.

This manuscript describes a new initiative officially launched to a global audience at the April 2023 CUGH meeting, the CUGH Capacity Strengthening Platform (CUGH-CSP), which aims to empower institutions and individuals in any setting to address many of these challenges and drive partnership engagement in ways that are most beneficial to their own needs and context by specifying priorities for training capacity development across clinical and research domains. The CUGH-CSP[2] identifies and aggregates institutional training training and individual mentorship needs from any setting and shares this information with the global community. Institutions can post training capacity resources, expertise, and available mentors. Global health stakeholders from any setting can use the platform to approach institutions and individuals with complementary priorities to explore partnership development,

1 Jose, L., Kiguli-Malwadde, E., Behere, A., Uakkas, S., Khan, A., Mazurkiewicz, E., et al. (under review). *Cross-sectional survey of CUGH capacity strengthening platform registrants: Matching global institutions to build effective partnerships.*

2 CUGHCapacityBuilding.org

training program participation, and mentorship opportunities aimed at strengthening training capacity.

Global health partnerships focused on capacity building and education face several challenges: (1) unequal access to potential partners and training opportunities, (2) lack of transparency regarding institutional training capacity priorities, (3) lack of clarity regarding the context of training capacity gaps, (4) inequity, lack of reciprocity, and absence of bidirectionality within global health partnerships with disproportionate power division between high-resource and LRS, (5) training initiatives are often driven by the priorities of grant mechanisms, external funders, or external entities, (6) high resource setting institutions often benefit inordinately from associated indirect funding, faculty development, and trainee educational opportunities, (7) geographic distance between partnering institutions often leads to inefficient logistical challenges, and (8) short-term partnerships create challenges through steep learning curves, a lack of depth and breadth in mutual understanding, and limited collaborative experience. The CUGH-CPS aims to address these pervasive challenges.

CUGH capacity strengthening platform

Individuals at academic institutions, non-governmental organizations, health facilities, governmental agencies, international organizations, and private agencies are able to register on the CUGH-CPS. Individuals may then create and search postings relevant to three potential matching categories: (1) Institutional Partnership, (2) Training Programs, and (3) Mentorship. Individuals seeking an **Institutional Partnership** are able to submit two types of postings: (a) training capacity gaps or (b) training capacity expertise and resources at their own institution. Through the **Training Programs** focus, registrants may post open enrollment training programs that are offered through their institutions. These are variable duration training programs open to individuals external to the institution that do not require the development of an institutional partnership. **Mentorship** postings allow registrants the opportunity to offer expertise or seek guidance to another individual through a mentoring relationship. Partnership, Training Program, and Mentorship postings may be categorized according to clinical or research focus, clinical and non-clinical domain, diagnostic category, and training level, if relevant. For Partnership and Training Program postings one may also specify additional relevant details such as preferred training or timing, duration, scope, preferred language, partner engagement arrangement, format, setting, enrollment modality, cost, and relevant certification or degree.

The platform currently has two main areas of capacity focus. The **General Database** is broad, covering clinical and research domains across a wide range of professions that may have relevance to global health, including medicine, public health, economics, social sciences, and law. The **Implementation Science Database** is a secondary access point with a specific focus. Individuals, institutions, and programs with the goal of strengthening capacity in implementation research are able to directly engage through this focused area of the database. Future iterations of this platform will have additional areas of focus. In order to match with other institutions or individuals, registrants can search the site to identify potential collaborators, securely communicate directly through the platform to connect, and develop global health partnerships that meet their own needs.

All contact information registered through this platform remains private and is not posted publicly. Registrants are able to connect to each other through the internal messaging platform to seek additional information and explore opportunities for partnering. These messages are not accessible outside of the platform. Each registrant has full control of when and how their own contact information is shared with other individuals. The activities of the CUGH-CPS are constrained to cataloging needs and capacity and sharing these needs online. The CUGH will not engage in the direct creation or maintenance of any partnerships.

This platform is an initiative of the CUGH Workforce Capacity Building Subcommittee of the Education Committee and has been developed in close collaboration with various strategic partners well-positioned to inform the responsiveness of the platform to end-user needs. This includes key advisors from academic centers and consortia focused on capacity building in the Global South, experts in implementation science, and representatives at academic centers in the Global North. The key advisory group met bi-weekly from February through June 2022 with a focused Beta Launch from July through September 2022 followed by revisions. A soft launch took place in January 2023 with continued refinements to the platform. In April 2023 at the initiation of the CUGH annual conference, the platform was formally launched and disseminated to a wide audience. Dissemination modalities include newsletters, webinars, conference presentations, journal articles, blog posts, and social media posts. In addition, CUGH will be engaging additional partners for support in dissemination efforts to a wider audience. We will fully evaluate the platform and disseminate quarterly reports that describe metrics related to (a) dissemination: modalities, number of communications; reach, (b) engagement: registrations, countries, institutions, messages, connections, number of website visits, time spent on website, pages per visit, conversion rate, user feedback, user satisfaction; (c) content: postings by region, country, type, and focus; and (d) impact: connections made by type, region, and country, established partnerships, projects, grants, and articles, number of resulting trainings and personnel trained, cost-effectiveness.

Discussion

Global health partnerships are an essential strategy to facilitate the resource sharing requisite to addressing existing global health capacity gaps. Best practices within a global health partnership create an environment that is supportive of and beneficial to all partners while optimizing impact. Striving for these best practices are critical to avoiding colonial ideologies, elevating the priorities of under-resourced institutions, and fostering efficient, effective, and equitable collaborative relationships (Table 1).

The manner in which partnerships are developed is a critical aspect of ensuring responsible collaboration. Current opportunities and processes for creating connections between institutions are often *ad hoc*. The initiation of relationships regularly comes through introductions by colleagues, chance meetings at conferences, or, frequently, the whim of one institution to work in a particular geographic area. Relationships that

TABLE 1 Global health partnerships focused on capacity strengthening and education should ideally reflect the following eight strategies or approaches.

1	Equitable matchmaking	All institutions should have equal access to potential partners and training opportunities in order to ensure equitable matchmaking.
2	Transparency in institutional training capacity priorities	Institutional training capacity priorities should be transparent in order to ensure that partnership priorities are driven by the institution with the existing training capacity gap and that productive matches are fostered.
3	Strong contextual understanding	Institution and training capacity objective context should be readily understood in order to ensure that developing partnerships are as productive as possible.
4	Equitable partnership	Equity, reciprocity, bidirectionality, social justice, and humility should be central practices within partnerships whereby power differentials are constrained and openly addressed.
5	Support expressed training capacity priorities	Grant mechanisms, external funders, or external entities should support the expressed training capacity priorities of the institution with an existing training capacity gap while avoiding a coerced (intended or unintended) training program focus.
6	Responsibly distribute secondary partnership benefits	Secondary benefits of partnerships (such as indirect funding, faculty development, and trainee educational opportunities) should be responsibly distributed.
7	Foster local partnerships, when possible	When possible, geographic distance between partnering institutions should be minimized to ensure efficiency and avoid logistical challenges.
8	Foster long-term partnerships	Long-term partnerships should be encouraged in order to build mutual understanding, institutional memory, and effective synergistic relationships.

develop from these auspicious beginnings are often imbalanced, significantly favoring the high resource institution. Similarly, global partnerships that originate around the development of research projects may be grant-driven (with defined parameters of technical domain, scope, and financing), creating power differentials between high resource institutions with access to agenda-focused funding opportunities and the LRSs where these projects ultimately take place (Ollila, 2005; Eichbaum et al., 2020). Individuals working for LRS institutions are limited in their ability to access timely information about opportunities, grow their network by attending international professional conferences in person, travel for collaborative exchange, and exercise choice in partnering relationships (López-Vergès et al., 2021). Institutions in LRSs may, therefore, be compelled to accept offers of project opportunities even when the focus runs counter to their existing priorities given the attraction of funding (López-Vergès et al., 2021). This situation may further stagnate or set-back progress toward strengthening their own capacity by draining personnel time and opportunities for trainee engagement in ways that respond to short- or long-term goals.

Ideally, global health partnerships and mentorship are equitable, reciprocal, and bidirectional (Melby et al., 2016; Eichbaum et al., 2020; Monette et al., 2021). In addition, a social justice focus and humility of partners are central practices (Plamondon et al., 2021). Global health partnerships may strengthen domain-specific workforce capacity within one or all of the engaged institutions as a core objective. These relationships also create additional opportunities such as the availability of unattached (indirect) funding for the institution, professional development for clinicians or researchers, and educational opportunities for trainees. Within a truly collaborative relationship, these benefits (primary and secondary) should be responsibly distributed, with equal opportunities for each institution to offer advantage and accept shared resources, as appropriate and ethical (Melby et al., 2016; Eichbaum et al., 2020; Monette et al., 2021).

Greater equity within the matching process could also facilitate the flow of resources and expertise in a bidirectional manner. In the current construct, knowledge innovation tends to be researched and recorded in high resource settings with subsequent unidirectional flow of evidence into LRSs where context is inherently different. In contrast, the concept of global innovation, whereby there is an innate recognition that disruptive and transformative technologies are developed in all settings, is highly valued. In turn, research, theory, commentary, and debate pass in a bidirectional manner to provide an evidence base to promote, support, and mainstream this type of knowledge flow that can solve problems of global implications (Harris et al., 2020; Crump et al., 2021).

Unfortunately, it is often challenging for institutions who are seeking partnerships to fully understand the needs and context of potential partners. The CUGH-CPS directly addresses these pervasive challenges by empowering institutions with training capacity gaps in several ways. Institutions in need of training capacity resources are now able to proactively catalog their high priority areas of need. These documented needs are, then, easily identifiable by high resource setting institutions who are seeking partnerships. This transparency raises awareness within the partnering process and encourages institutions with complementary training capacity to engage in ways that are the most meaningful. This priority sharing is, therefore, empowering and circumvents the influence of disproportionate power division in determining project focus (Boum et al., 2018). Institutions with matching goals are more able to connect with ease in a timely manner, which may result in a greater number of more efficient and equitable global health partnerships. The platform also directly empowers low-resource institutions in their ability to initiate engagement with high resource institutions in ways not previously possible.

In addition, partnerships that are able to engage frequently and longitudinally have the greatest opportunity for impact, given the depth of mutual understanding that develops over time (Dykens et al., 2014). Geographic proximity between partnering institutions can facilitate this longitudinal relationship and optimize the use of resources. The CUGH-CPS could foster more local connections between institutions in LRSs, offering opportunities for them to leverage their relative strengths within the exchange and sharing of resources (Evert et al., 2014; Herrick and Reades, 2016). The improved sharing of local resources and expertise to address training capacity gaps among institutions in the Majority World

(Alam, 2008; Khan et al., 2022) could, therefore, facilitate more efficient capacity strengthening.

Addressing the overwhelming global healthcare workforce crisis requires accessible, high-quality, and reliable training capacity within institutions in LRSs, globally. As a global society, we will need to institute a wide range of creative solutions in order to change the existing trajectory. By strengthening and creatively leveraging a global network of training institutions through the use of this novel platform, global health partners can more rapidly realize equitable, efficient, and effective relationships through the matching of training capacity priorities. The potential resulting clinical and research capacity will have profound implications for individual and population health outcomes globally in the decades to come.

Data availability statement

The original contributions presented in this study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

Author contributions

JD, KM, EK-M, LK, and ZC contributed to the conception and design of the project. JD, KM, and EK-M drafted the manuscript. LK, ZC, NR, AB, SB, CP, and SW revised the manuscript critically for content. All authors contributed to the acquisition, analysis, interpretation of data, and read and approved the final manuscript.

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Applying the Brocher Declaration to short-term experiences in global health in dental education

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Participating in Short-Term Experiences in Global Health (STEGHs) has become an increasingly popular way for dental students to learn about the global burden of disease and health inequalities by traveling to a low-income community. However, there is little information available in the dental education literature providing guidelines on best practices for STEGHs. Often little is known about the local dental practice laws and ethics guidelines. One useful resource is the Brocher Declaration. The Brocher Declaration, created by the Advocacy for Global Health Partnerships (AGHP), is a comprehensive document outlining best practices for developing ethical and sustainable global health partnerships. The six guiding principles are: (1) mutual partnership with bidirectional input and learning, (2) empowered host country and community-defined needs and activities, (3) sustainable programs and capacity building, (4) compliance with applicable laws, ethical standards, and code of conduct, (5) humility, cultural sensitivity, and respect for all involved, and (6) accountability for actions. The principles of the Brocher declaration can serve as a foundation for ethics and sustainability and can be easily applied to STEGHs in dental education. The authors present a set of recommendations specific to each principle to guide dental schools in offering STEGHs to their students. Participating in STEGHs represents a unique opportunity for students to learn about the global burden of oral disease, its risk factors, and the population and public health strategies to reduce oral disease in diverse populations. When done ethically, they may serve as a spark for students to become future leaders in global health.

KEYWORDS

public health, oral health, dental education, STEGHs, ethics

Introduction

It is estimated that 3.5 billion people are affected by oral health diseases globally, making it the most prevalent non-communicable disease (Watt et al., 2019). Reducing the prevalence of such a widespread disease requires innovative solutions in public health workforce development. This may be accomplished by designing formative programs that take place during dental education to improve students' public health skillset. Experiences for dental students that focus on the burden of oral disease, population health and oral health promotion are common among dental schools and include both didactic and experiential learning programs carried out both locally and abroad (Ballweg et al., 2011; Woodmansey et al., 2017; Lambert et al., 2020; Shick

et al., 2021). Participating in global health activities is popular among dental students and fosters critical thinking when tackling global health problems. Known as Short-Term Experiences in Global Health (STEGHs), they usually involve short-term dental student and faculty travel for less than 3 weeks to a Low-or Middle-Income Country (LMICs) or any community outside of the dental school. One study conducted in 2016, showed that approximately 65% of US Dental Schools offer STEGHs to their students (Woodmansey et al., 2017).

Developing a fit-for-purpose STEGH program involves several components that must come together harmoniously to ensure these programs are effective for both the participating students and the host community (Lasker, 2016). Another complicating factor is that there is little to no monitoring and standard setting for these programs, as no one professional entity holds legal jurisdiction over STEGHs (Rowthorn et al., 2019). There is a paucity of information available to inform dental schools about global health best practices. The American Dental Association's Code of Ethics is an open access resource outlining best ethical practices in dentistry and these may be applied to STEGHs for dental students (Shick and Woodmansey, 2020; ADA, 2023). Many professional groups and individuals have developed proposed guidelines, although there is no enforcement of these recommendations. Importantly, the host country's Code of Ethics and dental practice laws, if available, must be observed.

Another recently developed resource is the Brocher Declaration (Prasad et al., 2022). In 2017, a network of leaders from academic, faith-based, NGO and corporate backgrounds, including oral health representatives, was created to address the need for a unified response to deficiencies in the programs for volunteers and students in global health. This network came to be known as Advocacy for Global Health Partnerships (AGHP), and it has been working to raise awareness about ethical and sustainable practices. In 2020, AGHP, in consultation with a wide diversity of global health practitioners, developed the Brocher Declaration, a statement of six principles that has been endorsed by over fifty organizations worldwide.

The practice of dentistry in global environments coupled with student participants presents a myriad of unique challenges not always encountered by other health professions and requires careful consideration. The aim of this publication is to present the original Brocher Declaration principles and provide recommendations for how they may be applied to STEGHs in dental education by faculty and students as well as by host partners.

Principle 1: Mutual partnership with bidirectional input and learning

Health care varies greatly in terms of diseases, cultural and social determinants of health, languages spoken, clinical protocols, as well as political and economic conditions. This often leads to misalignment of short-term global health activities with the host country workforce and health priorities. Global health engagement should emphasize mutual partnership and bidirectionality, recognizing the expertise and experience of host country health professionals.

a. Before initiating any global health work, a strong relationship with a local partner must be established based on mutual respect for everyone's ideas related to the oral health program. It often takes time to develop a trusting relationship where both partners have an equal voice and opinion defining program goals, objectives, design, implementation, monitoring, and evaluation.
b. Discussions should include bi-directional input between the dental school and the host partner. If cultural or language barriers exist, these must be addressed to ensure everyone involved has equal participation and understanding.
c. Discuss each partner's strengths, weaknesses, overall program goals, and what each partner can contribute to the program. This will include both financial and human resources.
d. A needs assessment should be included in a pre-program site visit and incorporated into the designing of program implementation.
e. Ensure all participants go through pre-departure training, addressing what it means to be a visiting volunteer working within a foreign healthcare system.
f. Together with all partners, draft a program report and include any data collected. Ensure each involved partner agrees to the language used, the data reported, and the next steps for continued care.

Principle 2: Empowered host country and community define needs and activities

When short-term global health engagements are based on perceived needs or available skills, they can undermine the local voice while diverting much needed funds and efforts away from real needs, along with placing added burden of accommodation and safety on host communities. This can be exacerbated by power differentials between people in high-and low-income countries. The host country should drive the agenda for healthcare work. This begins with empowered host communities who understand specific needs for health care and indicate the activities that would lead to sustained health improvement. Special emphasis should be placed on the social determinants of health and the relevant Sustainable Development Goals (SDG).

a. STEGH programs should be developed because a host partner wants the dental school's partnership and collaboration, not because the dental school wants to travel to a certain location for educational, humanitarian (and possibly tourist) activities. Host partners should communicate what type of program will be most helpful to them and their community. For example, direct dental care, prevention, education/training, research support, or make it clear if a proposed program is not a priority.
b. Ensure that any help with travel, logistics, transportation and accommodation for the dental school team is not an imposition, burden or drain of host partner resources.
c. STEGHs should use the social and commercial determinants of health, the United Nations Sustainable Development Goals, and the World Health Organization's Global Oral Health Action Plan as a backdrop to improve population and individual health (Peres et al., 2019; Global Oral Health Action Plan, 2023; United Nations Sustainable Development, 2023).
d. Ensure final programming decisions are made by the host community.
e. If the host partner is not a local dental school or oral health organization, consider asking the host partner if it is appropriate to include any local oral health professionals or dental schools in the region/country.

Principle 3: Sustainable programs and capacity building

Global health programs should aim at capacity building within local communities such that important health needs are met and strengthened. This is possible when programs have sufficient input from the local communities and are committed to long-term healthcare development and sustainability. The overarching goal should be one of strengthening health systems rather than providing unsustainable alternatives.

a. A full understanding of the host community's health and oral health care system, systems of oral health education, and Universal Health Coverage is the first step in program development.
b. Identify long-term sustainability goals with the host partner. If there are no local oral health providers in the area, discussions may be held with doctors, other health care professionals, or community leaders.
c. Identify oral health promotion activities that can be carried out by host professionals and community members rather than the visiting dental school team to improve long-term sustainability.
d. Programs aimed at improving oral health systems, for example partnering with local Non-profit Organizations, Non-governmental Organizations or dental schools, should be encouraged.
e. If offering direct dental care, consider The Basic Package of Oral Care document as a useful guide (Frencken et al., 2002; Helderman and Benzian, 2006). Minimally invasive preventive and dental treatments may be included as a cost-effective way to address population health (Slayton et al., 2018).
f. Community interventions such as the global Water, Sanitation and Hygiene program (WASH) program or School-Based Oral Health programs may be easier to implement and continue by the host partner (Benzian, 2010; Jürgensen and Petersen, 2013; Duijster et al., 2017).

Principle 4: Compliance with applicable laws, ethical standards, and code of conduct

Quite often, short-term engagements do not consider the existing legal framework in the host country. Clinical care has been framed within the context of the classic bioethical principles of autonomy, justice, beneficence, and non-maleficence. Engaging in global health activities requires entities to consider other ethical principles including social justice, social contract, and utilitarian principles. Short-term global health partnerships must establish and abide by common quality principles and legal requirements.

a. Perform due diligence researching and abiding by the host country's code of ethics, dental practice laws, licensure requirements, and scope of practice for licensed dentists and dental students from other countries. Be aware that some restrictions of scope of practice for dental students may exist.
b. If no host country code of ethics or dental practice laws are available, consider using those of the visiting dental school's country.
c. Other ethical and legal considerations include: gold standard processes of disinfection and high-pressure steam sterilization, having radiographic (X-ray) capability to properly diagnose and treatment plan, using materials and supplies that are not expired, and transparent importation of materials, supplies, instruments, and medications in and out of the host country.
d. Informed consent for treatment including various treatment options should always be obtained using the appropriate language and education level of the patient to ensure understanding.
e. While HIPAA is applicable in the U.S., it may not be in other countries. However, respect for a patient's confidentiality is still important. This includes obtaining consent and permission to take and use photos. Be mindful of this particularly when hoping to use photos on dental school websites, materials, or personal and professional social media.
f. Consider drafting a Memorandum of Understanding (MOU) between all parties involved in the partnership prior to starting any work.

Principle 5: Humility, cultural sensitivity, and respect for all involved

International health volunteers and the organizations that coordinate their work often have motivations other than contributing to the health of people in host communities. These experiences can be seen as privileged volunteers gaining social capital at the expense of disadvantaged host communities. To alleviate this dynamic, those participating in short-term engagements must respect the culture, history, strengths, and limitations of the communities they are visiting, while simultaneously recognizing the limitations of their cursory understanding as non-members of the community.

a. Dental school STEGH teams should be prepared by receiving robust pre-departure training about the host country's history, local culture, customs, traditions, economy, political system, health care system, geography, environment, religions, socioeconomic status of the population, predominant social determinants of health, and languages spoken. The role of student as guest and learner should be emphasized over any depiction as a helper.
b. Every effort must be made by the STEGH team to work seamlessly within the local health care system with the understanding that provision of dental care varies greatly between countries and even within communities.
c. Dental schools may choose a selection process to ensure that students participating in STEGHs are motivated to serve in a self-less and humble capacity rather than for self-serving reasons.

Principle 6: Accountability for actions

The overall emphasis of global health engagements should be on long-term health improvement of host communities. Global health engagements should be evaluated appropriately so that outcomes, unintended consequences, and spillover effects are reduced. If these standards are not upheld by short-term global health engagements, or if

they cause negative impacts, they should be altered or ended. There should be special emphasis placed on the concerns of environmental impact due to the travel and activities involved.

a. Utilize continuous program monitoring and evaluation processes of all STEGH programs, making changes and improvements over time as needed.
b. If providing clinical care, be cognizant of the local dental community who rely on this population for professional sustenance.
c. If providing clinical care, arrangements should be available for patient follow-up in the case of dental treatment failures or emergencies.
d. Be aware of the resource intensity of STEGHs and consider virtual and telehealth options as a viable way to reduce international travel cost and environmental footprint.
e. Environmental concerns such as the use and disposal of amalgam, disposal of biohazardous materials, sharps, and X-ray chemicals should be addressed. There is a global movement away from the use of mercury containing materials in dentistry (Countries meet to accelerate implementation of the Minamata Convention on Mercury, 2018).

Conclusion

The Brocher Declaration offers six principles for ethical and sustainable global health engagement that are relevant for all health professions, including dentistry. These principles emphasize the importance of establishing mutual partnerships, empowering host communities, building sustainable programs and capacity, complying with applicable laws and ethical standards, practicing humility and cultural sensitivity, and being accountable for actions.

These recommendations provide guidance for dental educators, administrators, and students to develop effective and sustainable STEGH programs. Prioritizing the application of the Brocher Declaration's principles to STEGH programs in dental education will increase the likelihood that these initiatives benefit all parties involved. STEGHs represent both a valuable opportunity for dental students to learn about the oral health challenges faced by diverse populations in diverse locations and a potential to contribute to oral health promotion and disease prevention when done ethically and responsibly. They may also serve as a catalyst for dental students to become future leaders in global health and development.

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Data availability statement

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

Author contributions

All authors listed have made a substantial, direct, and intellectual contribution to the work and approved it for publication.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Decolonizing global health curriculum: from fad to foundation

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Introduction: Increasing calls have been made to decolonize global health education but there has been a lack of consensus and clarity on how this should be done. We conducted a qualitative study to understand current educational programs and curricula that aim to educate public health and allied health students to increase awareness of how colonialist structures of power influence current global health practice and provide students with tools to decolonize global health. Our goal is to inform related curriculum development and provide recommendations.

Methods: We conducted key-informant interviews with 14 study coordinators and faculty from institutions of higher learning with global health programs who are involved in developing educational approaches. All interviews were audio recorded, transcribed, and analyzed using an 'up from the data' approach.

Results: Participants varied in their understanding of decolonizing global health and recognized that there is a lack of guidance in the field; this has an impact on how curriculum is developed and taught. Participants described a range of decolonizing global health educational activities in the classrooms and in applied learning activities. Most programming was situated in Diversity, Equity, and Inclusion Initiatives and participants did not always feel this was the best 'home' for such work; to some this reflected a lack of institutional support. Other institutional barriers included lack of protected time for faculty and limited budgets for speaker honoraria, co-creation, and related teaching expenses.

Discussion: Institutes of higher learning can play an important role, either positively or negatively, in decolonizing global health education. At a minimum such institutions should financially support faculty to incorporate decolonizing global health in their pedagogy and strengthen scholarship towards common understandings. More substantive institutional support is needed however to meaningfully transform institutional relationships that actively support equitable partnerships, co-creation, and responsiveness to local community priorities.

KEYWORDS

global health, pedagogy, curriculum, teaching, decolonization and education

1. Introduction

Global health education is rooted in settler colonialism and a white supremacy mindset (Packard, 2016; Binagwaho et al., 2022). The field's origins have contributed to the perpetuation of neocolonialism, knowledge erasure, and unequal power dynamics within global health (Shah et al., 2019; Jensen and Lopez-Carmen, 2022; Naidu and Abimbola, 2022). Discussions around how to meaningfully transform the field of global health education and address the underlying white supremacy mindset have recently proliferated (Binagwaho et al., 2022; Kwete et al., 2022; Naidu and Abimbola, 2022). A comparative review specifically explored approaches to "decolonize" curriculum and pedagogy in higher education, which range from recognizing constraints to disrupting and making room for alternatives (Shahjahan et al., 2022).

Despite these discussions, there are indications that the field of global health education is significantly lacking in its efforts. This is evident in Opara's call to "decolonize the decolonization movement," which calls attention to specific concerns with the decolonization movement in global health. Namely, "the urgency dictated by white guilt leaves little space and time for actual reflection, deconstructing, deconditioning, relationship-building, and structural dismantling." This urgency leads to insufficient critical power analyses and the continued perpetuation of colonial mindsets within decolonization movements (Opara, 2021).

A recent scoping review also highlighted the inadequacies of anticolonial education in global health. Collective understanding of a global health curriculum with sufficient focus on anticolonialism is lacking, and there are limited publications demonstrating work in this space. Among these limited publications, there is a focus on the individual student and their awareness rather than pedagogy, structural change, and the experience of faculty and global health partners. In addition, a continued focus on experiential learning via short-term experiences in global health (STEGHs) raises concerns, as these experiences are often one-sided and extractive (Kalbarczyk et al., 2020; Perkins et al., 2023).

The authors recognize that not all educational initiatives or approaches are published in peer reviewed literature (Bhakuni and Abimbola, 2021), and additional approaches are needed to better understand the current scope of decolonizing global health education. We conducted a qualitative study to understand current educational programs and curricula that aim to educate public health and allied health students to increase awareness of how colonialist structures of power influence current global health practice and provide students with tools to "decolonize global health." We sought to assess the extent to which global health programs address topics related to decolonizing global health and understand the educational approaches being used.

Our goal is to inform related curriculum development and provide recommendations and lessons learned. Research on the current state of the field and innovative approaches is particularly important to build a repository of resources for academic leadership and faculty in global health (Perkins et al., 2023).

2. Materials and methods

We conducted key-informant interviews (KIIs) with study coordinators and faculty from institutions of higher learning with global health programs who are involved in developing educational approaches for teaching health professionals and public health students about decolonizing global health.

2.1. Participant recruitment

We used two strategies to identify and recruit participants. First, we conducted an online search to identify instructors and coordinators of courses with publicly available syllabi that addressed topics related to decolonizing global health. We emailed these individuals directly requesting an interview and/or requesting they connect us with others who may have expertise in this topic. Then we sent a call for participants via the Consortium of Universities for Global Health (CUGH) listserv. CUGH's membership includes over 182 academic institutions and partners in more than 39 countries; the CUGH network spans roughly 30,000 global health professionals worldwide. Interested individuals were asked to respond to the study team with their information and a brief statement of experience related to teaching decolonizing global health. The study team assessed each respondent's eligibility and then followed up to schedule an interview.

2.2. Conducting KIIs

Eligible participants were contacted via email and asked for their availability for a 60-min interview to be conducted via Zoom. Each participant reviewed the consent form and gave their consent verbally prior to the start of the interview. Interviews lasted 35–75 min. All interviews were audio-recorded; the study team also took written notes during the interview.

2.3. Analysis

Recordings were transcribed by a third-party transcription service, Rev.©. All identifiers were removed from transcripts prior to analysis.

Data was analyzed using an adaptation of Richards' "Up from the data" approach. Transcripts were closely read by each analyst (SR, AK, and SP) multiple times, followed by annotations, detailed note-taking, and open coding. Analysts regularly wrote individual and collaborative memos to reflect on the process and held group sessions to iteratively define and apply codes and link data (Richards, 2015). Findings arose out of these memos and group sessions, and transcripts were re-visited considering defined themes.

2.4. Positionality and reflexivity

As a team of researchers, we recognize that this research requires a critical examination of our positionality and how it may shape our understanding and interpretation of decolonizing global health. Decolonizing global health is a complex and nuanced topic that encompasses a range of issues, such as colonialism, neocolonialism, power imbalances, structural racism, and structural inequalities.

The research team employed several approaches to continuously engage in reflexivity, examine positionality, and mitigate potential biases. Interviewers (SR and MR) consciously used active listening techniques to ensure that participant perspectives were heard and

accurately represented in the data. Following interviews, interviewers (SR and MR) reflected on their positionality via memos, including thoughts on interviewing techniques, interpretations of the data, and dynamics within interviews. Analysts (SR, AK, and SP) wrote memos throughout the analysis process to reflect on the coding process and their interpretations. While our individual experiences and perspectives influenced how we formed connections and made sense of the data, we hope to provide a nuanced and inclusive understanding of the current state of educational approaches for teaching decolonizing global health.

3. Results

We conducted 14 KIIs with participants in various stages of their global health education careers.

3.1. Defining decolonizing global health in education

Across participants there was a wide range of interpretation on the definition of decolonizing global health education and how to operationalize it.

> *We're still not clear about the difference between decolonization, diversity, and anti-racism. KII 13.*

> *I designed all these debates about what is decolonizing global health? Is it possible to decolonize global health? Which are the challenges? Which are the possibilities? What are we meaning by decolonizing global health? KII 09.*

Participants described difficulties with a lack of evidence-based curricula and set of "desired results" from an evaluation standpoint. Lack of clarity around metrics and expectations has made it more challenging to implement decolonizing global health education initiatives.

> *I do think that one of the biggest challenges in this kind of work is really understanding what it means for a learner to come out of the curriculum and have had the desired result, because I think the desired result is challenging. KII 03.*

Participants' work in this area was often situated within Diversity, Equity, and Inclusion (DEI) initiatives, which were also the most common funding source mentioned to support this work.

> *We have our DEI agenda, which is about diversity, and there's a decolonizing agenda and there's an overlap between them. But they are not the same thing; they feed off each other. KII 07.*

> *Understanding the difference between diversifying* versus *decolonization, where diversification is still giving, keeping the power and the hands of whiteness, how much to diversify and who to invite to allow the diversification* versus *decolonization is taking the power away and distributing the power… KII 11.*

> *We had a DEI network of staff…and that group started to reflect on the issues of coloniality in global health and in our own institution. And we are pointing to this kind of overlap between DEI and decolonization. It got a much stronger impetus in the aftermath of the murder of George Floyd. And in terms of education, it was people saying, "how is the global South represented in our teaching? Why are all of the examples from former colonies? Where are the examples from Latin America, from Asia? KII 07.*

One DEI training course at their university helped a participant to reflect on their teaching and practice from an identity point of view.

> *When I started lecturing in global health it was like, how do we reflect on what we bring to a different setting, and how might that not matter, and how might it matter? And how can you be aware of that so it's not something that really catches you off guard? KII 12.*

Another participant reflected on the racial and ethnic diversity within their institution and how this affects global health teaching.

> *The fact that the profile of our staff at the institution is predominantly white affects what we teach, how we teach it, how students feel in a classroom, what they see and experience as being expertise and power. KII 07.*

3.2. Motivations for decolonizing global health education

Participants were asked to describe their motivations for decolonizing global health education. Eight participants mentioned being driven by ethical considerations. For some this shift was driven by a desire to challenge colonial roots of global health and promote a more equitable and mutually beneficial approach to health initiatives.

Others described missed opportunities for bidirectional learning and partnerships. They noted that educators are becoming increasingly aware of the need to challenge this paradigm and encourage more bi-directional approaches and collaboration.

> *I think a lot of that [issues with global health] has to do with our one directional teachings of global health, and the maybe missed opportunity to think in reciprocal terms about how we can learn from less resourced countries or places where we are actually physically sending our students. Instead of just prescribing what we feel global health means, we need to learn more directly and less indirectly from different populations. KII 10.*

Participants specifically voiced a desire to prevent future leaders from perpetuating existing approaches by ensuring they are equipped with necessary skills, and one participant anticipated that systemic change will be furthered by future generations, starting in schools.

> *I think we are training future leaders in global health. And if we miss this opportunity to teach this kind of mutual learning now, then these future leaders will perpetuate the same kinds of neo-colonial issues that we are seeing where the global north has been prioritized*

> *in leadership in global health organizations. And there's certainly more male leadership. KII 10.*

> *I think we are going to see more change. I really do…. I think it's going to start in schools… And then I think it's going to slowly penetrate to some of the other places. KII 03.*

Some individuals were driven by their own personal experiences and identities. For example, one participant identified as one of the few minorities at their institution and described their personal experience moving between a 'colonial' country and a 'post-colonial' country, and the importance of 'decoloniality' in both contexts.

> *People are moving on, people are talking about post-coloniality. I'm not sure if I fit in this system of post-coloniality because I live in two separate worlds. I'm moving between a colonial system and a 'post-colonial system'. So this is one motivation to address coloniality itself…Decoloniality is about resistance, it's about colonial legacy, it's about exploitation, it's about undoing all the things linked to coloniality. I might not be able to resist physically but I think the ability to resist the colonial legacies, or the ability to undo some of the things that affect minds–this is interesting to me because it is personal. KII 13.*

3.3. Educational approaches to decolonizing global health education

Course approaches related to teaching decolonizing global health ranged widely, from an introduction, framing, or guest lecture to an entire course dedicated to the topic. One participant voiced the idea that increased dedication to this topic was warranted.

> *This topic needs more attention. This could just be a whole course and instead of it being a 40-min lecture tacked onto something. KII 12.*

Specifically, presenting systemic issues without a discussion about history, meaningful reflection, or action is lacking.

Some participants described first steps or entry points such as expanding reading lists to include authors from LMICs and Indigenous communities. One participant discussed inclusion of theories relevant to decolonizing global health education throughout course content, such as Wallerstein's "world-system" theory (Wallerstein, 2011), dependency theory (Frank, 1966), Freire's consciousness raising theory (Freire, 2005), and Fanon's contribution to critical theory (Frantz, 2021) (KII 01).

Another participant noted that while addressing course reading lists is a good start, it is important for researchers to collaborate with varying partners on the development of the content itself. This ranged from co-creation with students, to exploring bidirectional approaches and mutually beneficial partnerships.

> *We want [students] to have more voice in the content of what we deliver, in the way that we deliver it. We want them also to bring in their experience. We want them to understand that learning is a mutual experience. KII 13.*

> *Teaching these kinds of courses… bringing both practitioners as well as scholars together to talk about, "So what would that look like? How would we decolonize the research? How do we decide even the research questions are biased, they are based on what our interests are? So how do we ensure that those questions are relevant to the countries where we work? KII 01.*

> *How do we partner with those people to help them address and get their healthcare needs?… we are not the rescuers, that's not our goal at all. For lower resource countries, we want to help them build capacity in any way we can, but it's really to learn about what they do well in their systems… Are there things that we can take away? Are there things that we can give to them? A collaboration on providing the best type of… care across the globe. KII 05.*

However, another participant cautioned that bidirectionality may not be the ideal approach in every situation and explored responsibility within their partnership.

> *Part of the purpose… is to make it actually not as bidirectional because it should not be the responsibility of my… colleagues to train my trainees how to not be jerks. That should be my responsibility. But I think what's hard is that I also do not have all of the content expert of what it looks like to not be a jerk on the field. So we try to, as they had the bandwidth, get their perspective, but then create a curriculum where certainly international partners can be involved, but they do not have to feel the burden of having the decolonization conversation with US-based trainees. KII 03.*

One participant acknowledged the differences between what a student is learning, and what is being modeled in the institution around them to further discussion and understanding.

> *What should be the partnership according to these decolonial approaches… How can these debates also contrast with what you are living in the field or in other discussions in class? KII 09.*

Participants generally agreed that it was important to expose students to diverse methods of teaching and learning delivery, from classroom readings and theory, as mentioned previously, to immersion and applied learning. Participants discussed increasing exposure and immersion as linked to learning, and two participants specifically discussed the importance of participating in experiential learning within your own community (i.e., decolonizing global health takes place within countries or communities as well as between countries or communities).

Participants offered case studies, including examples of power negotiation, as useful tools for applied learning, specifically in relation to self-awareness during travel and immersion.

> *"Our focus is more practical examples. And specifically, I can think of case studies that we go through… that, hopefully, will mitigate any of those feeling of superiority… And again, these are those reducing that decolonized view of what global health is, and really focusing on learning from your partners and being true, yeah, equitable partners." KII 04.*

Participants also spoke of the importance of reflection, embedded throughout the learning process.

> *Reflection is absolutely critical for decolonization in general. So, I would say that decolonization is something that requires regular reflection and reflective practice. So, I make sure the students complete reflective journals every week. DGH 11.*

> *Students write a six-page reflective, essay, focused on their positionality in global health regarding the discussions held during the quarter… they could ambition their future career in global health considering the debates we have had here. And where can they focus, how can they contribute if that's part of their interest to decolonize global health, considering their future careers as well. KII 09.*

One participant also encouraged acknowledging and making space for the time and energy required to meaningfully engage with this work.

> *It takes a lot of time. It takes a lot of emotional and mental energy. KII 11.*

3.4. Institutional barriers

While participants were enthusiastic about their efforts to decolonize global health, they reflected on systems- and institutional-level challenges to doing this work.

Some programs struggle to embrace change because of existing processes and regulations, such as those set by accrediting bodies. One participant mentioned that they cannot make important changes to their program because the accreditation board has already approved the existing curriculum.

> *Our program at the moment… is accredited, and so we cannot fool with it a lot, because the accreditation board has already approved what we are doing. KII 14.*

One participant felt that there was a lack of institutional will to enact change.

> *There are some institutions that are oblivious by choice, meaning global health wasn't really on their radars or they want global health enough to be able to recruit [trainees], but it's not their big thing. And then I think that there are institutions that, while they may not be openly telling their faculty, 'You cannot participate in [DGH curriculum]', but they will never endorse [DGH curriculum]. KII 03.*

Four participants saw this lack of institutional support reflected in a lack of funding. This includes faculty time, speaker honoraria, and teaching expenses.

> *That workshop is very expensive to run. And we have been trying for years to get our institution to say, 'We'll let you have a peer-to-peer grant workshop for global health where you can focus on grants and that work in the global setting.' That would be one example where money is a huge barrier. KII 02.*

Others felt that their institutions were trying to support decolonizing global health initiatives although very slowly.

> *I think the institution is trying, working really, really hard on its colonial roots… It's late, very, very, very, very, very late. But they are working hard on it. KII 06.*

One participant believed that large organizations in charge of global health education, such as the Consortium of Universities for Global Health, should take on a leadership role and standardize practices and teaching so everyone is on the same page. Others reflected on the importance of such standardization since people are in very different places regarding decolonizing global health within this field, and it can be hard to move these conversations forward, particularly with decision-makers.

At a systems level, many participants reflected on the colonial systems and structures of global health, including funders and multilateral organizations, and noted that the field cannot be decolonized until they are.

> *…a lot of the people who run the system are based in Western countries. And those people in Western countries, be it government, be it UN, be it large NGOs are not decolonized themselves. So until they decolonize their own minds, they can talk about DEI and they can talk about anti-racism and they can talk about decoloniality, but they'll never actually be able to do it. KII 06.*

4. Discussion

Institutions of higher learning can play a major role, positively or negatively, in decolonizing global health education but there is lack of clarity on how best to approach this scope of work. In our study we found some participants focused on applied learning experiences such as study abroad and STEGHs while others described classroom-oriented approaches such as addressing reading lists. None of our participants described existing initiatives designed to transform institutional structures that uphold colonial systems. Junior faculty may be engaging more with this work but may also have less power to influence larger systems and structures. This may lead to the various definitions and approaches evident in our study.

Many of our participants described the additional effort this work takes and noted that there was limited institutional support (i.e., funds for salary) for faculty to engage in decolonizing global health education. Protected time for teaching has been widely cited as a barrier for faculty in health education amidst competing priorities (De Villiers et al., 2018; Stadler et al., 2020; Couper et al., 2023). Institutions at a minimum should provide protected time to faculty interested in teaching decolonizing global health and should support their scholarship to standardize definitions, approaches, and methods of evaluation and establish next steps. Some faculty may be peripherally interested in incorporating decolonizing principles into their pedagogy and content but do

not know how, or even where to start (Perkins et al., 2023). Universities may also consider providing protected time to faculty across different Departments who can support others and offer concrete examples on incorporating decolonization into pedagogy, syllabi, and content.

We also found that DEI Initiatives tended to be an immediate, if sometimes imperfect, home for decolonizing global health work. Today's DEI landscape in Higher Education includes managing campus climate flashpoints, building equitable recruitment processes and retention resources, implementing initiatives that shift institutional culture towards belonging for all, and creating meaningful internal and external partnerships. Other ongoing considerations include upcoming legislation that could potentially jeopardize DEI efforts across public and private institutions, and remaining flexible enough to pivot and redirect energies, support and resources around emerging incidents of ongoing harm and trauma as they relate to Black, Indigenous, and people of color and other under-represented groups in our institutions and society.

The terms 'diversity,' 'equity,' 'inclusion,' 'anti-racism,' 'belonging,' and 'decolonization' are sometimes used interchangeably by institutions to denote DEI initiatives. These concepts have evolving definitions, and while inter-related in practice, they also represent distinct outcomes. Both DEI and decolonizing initiatives require an understanding and acknowledgement of institutional power structures, systems of oppression and marginalization, and intersectionality. Both can serve as agents to challenge and dismantle inequities. These initiatives can be well-aligned, but using the different terms interchangeably without nuance can present some challenges.

Decolonization efforts embedded within a DEI office may benefit from existing funding mechanisms and internal/external relationships, and staff that is invested in advancing these initiatives. However, situating decolonizing initiatives within DEI offices may also require staff to build additional capacity, skillsets, and expertise in frameworks and strategies that intentionally center unpacking colonial bias. Offices that are equipped to support DEI initiatives but are also assigned decolonizing education efforts (as an add-on) are balancing finite capacity and resources (funding, personnel, etc.) while managing competing priorities and expectations. In such cases, it is critical to assess the strategic, consistent inclusion of a decolonization lens and mission to prioritize resources and accountability for these initiatives.

Our study also speaks to current engagement with capacity-building and local solutions to problems within global health education. While some participants described course content related to these topics, there was limited systems-level (i.e., institutional level) engagement with bi-directional learning and teaching or course co-creation. While participants were aware of the importance of moving away from short term or extractive relationships with LMIC partners, there were few examples of how academic institutions were promoting this outside of the classroom. Binagwaho et al. (2020) suggest embedding community-based education into university programs where research projects are co-created and reflect community priorities. They also argue that we must strengthen institutions in LMICs through financial investment and partnership strengthening initiatives such as faculty exchanges and targeted training based on the needs of the institution (Binagwaho et al., 2020). Existing approaches to research partnership evaluation may also be adapted to articulate "desired results" and evaluate implementation of community-based education (THET, 2023). But institutional barriers remain for developing such programs and for addressing institutional partnerships rooted in colonial structures. Kulesa and Brantuo (2021) enumerate three such barriers including an overemphasis on intercountry relationships, implicit hierarchies, and ethical dilemmas (Kulesa and Brantuo, 2021).

Given the depth and breadth of work required in this space to meaningfully transform educational systems, and ensure this movement is not a trend, institutions must meaningfully invest in their educational pillars. This will mean supporting faculty to transform the design of their courses (from syllabi and reading lists to core concepts, tools, experiential learning approaches and applications), to explore and define their pedagogy, and co-create novel approaches with a global cadre of experts.

4.1. Strengths and limitations

Our primary recruitment method was a call for participation via the CUGH network with over 170 academic institutions and other organizations around the world. While membership to CUGH may be both institutional and individual, we may have missed key stakeholders conducting this work who do not have access to this network. Further, given limitations of the research team, we were unable to interview individuals who do not speak English.

5. Conclusion

More work is needed to build consensus and guidelines on how to incorporate decolonization in global health education in the classroom and within institutes of higher learning. At a minimum, institutions should financially support their faculty to do this work and enhance scholarship in decolonizing global health education through protected time or incentives. Ultimately though these institutions need to invest in educational partnerships to co-create and co-offer programs that are responsive to community priorities.

Data availability statement

The datasets presented in this article are not readily available because they may be identifiable due to the content discussed in the KIIs. Requests to access the datasets should be directed to AK (akalbarc@jhu.edu).

Ethics statement

The studies involving human participants were reviewed and approved by Johns Hopkins Bloomberg School of Public Health Institutional Review Board. Written informed consent for participation was not required for this study in accordance with the national legislation and the institutional requirements.

Author contributions

AK and SP conceptualized the study and supported the data analysis. SR conducted data collection and initial data analysis. MA authored discussion on DEI. All authors contributed to the article and approved the submitted version.

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Conflict of interest

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Equitable global health research collaborations with a mind of human dignity

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This paper explores the importance of equitable global health research collaborations that prioritize human dignity. It addresses the need for Global North partners to increase their efforts in raising awareness among all actors in global health. The aim is to bridge the gap in research collaborations and promote equitable practices that uphold the principles of human dignity and equity. A comprehensive review of existing literature and case studies was conducted to examine current practices and challenges in global health research collaborations. The review focused on the role of Global North partners in promoting equitable collaborations, capacity building efforts, and the impact of colonial legacies on research dynamics. The findings highlight the need for deliberate actions by Global North partners to raise awareness and promote equitable research collaborations. Initiatives such as Principal Investigator positions to partners from low- and middle-income countries (LMICs) during grant applications have been observed. Assigning first/last authorship positions to LMIC members is gaining momentum. However, further efforts are necessary to enhance the inclusivity of global health research collaborations. We emphasize the need for standardized definitions of global health that encompass human dignity and equity. Urgent action is required to ensure that all actors in global health research collaborations embrace human dignity. By deploying new techniques and tools where they are most needed, we can effectively promote equitable research collaborations that contribute to improving the health of individuals worldwide.

KEYWORDS

equitable, global health, research collaboration, decolonizing, human dignity, Ghana

Introduction

This paper presents a perspective on fostering equitable global health research collaborations with a focus on prioritizing human dignity (Aellah et al., 2016; Green et al., 2023). Our discussion draws upon extensive experiences in the field of education and research, primarily from the Global South, supplemented by limited insights from the Global North. Furthermore, we have incorporated ideas and insights derived from other publications, which have contributed to the formation of our paper (Gostin and Sridhar, 2014; Boum Ii et al., 2018).

We firmly believe that a thoughtful reflection on the disparities and uncertainties prevalent in global health research and education collaborations can significantly enhance the

consideration of the human dignity dimension throughout the entire process, including conception, planning, development, and implementation of such collaborations (Pratt and Loff, 2014). To address this, our paper focuses on four broad subsections or themes of global health research and education collaborations. These themes encompass the lack of clarity around the term "Global Health"(Sridhar, 2012), an analysis of current global health research and education collaborations (Gostin and Sridhar, 2014; Aellah et al., 2016; Boum Ii et al., 2018), identification of the driving forces behind existing research and education partnerships (Sridhar, 2012), and finally, discussion in the form of proposing future actions aimed at cultivating equitable global health research and education collaborations (Sridhar, 2012; Pratt and Loff, 2014; Green et al., 2023).

By exploring these aspects, we aim to shed light on the challenges and opportunities present in global health collaborations, with the ultimate goal of promoting fairness, inclusivity, and respect for human dignity.

Subsections relevant for the subject

Meaning of global health and actors

The term "Global Health" carries various meanings and interpretations among stakeholders, with significant implications for health. Given the lack of clarity surrounding global health, this paper aims to contribute to the ongoing debate by emphasizing the need to have a shared understanding and clear definition.

Before delving into the discussions, it is essential to reflect on the evolution of concepts that have shaped global health research and global health collaborations. Several decades ago, developed countries (referred to as Global North) colonized nations and territories, which led to the formulation of concepts and approaches to provide healthcare to the occupied lands. This historical context has influenced the power dynamics, resource distribution, and priorities in global health research collaborations. The legacy of colonialism and its impact on health systems and research practices has been widely discussed in academic literature and critical global health perspectives (Fanon, 1961; Farmer, 2004; Pfeiffer and Chapman, 2010). These discussions highlight the need for critical reflection and a shift toward more equitable and decolonized approaches in global health research collaborations.

As a result, different concepts and approaches emerged, including community health, public health and tropical medicine and others, which were expected to be embraced and implemented by all countries. This progression continued with programs like the primary health care (Alma-Ata Declaration, 1978) (WHO and UNICEF, 1978) and international health, culminating in the contemporary concept of Global Health.

These concepts were received with different interests and intentions. In recent times, donors and researchers from the Global North have taken the lead, believing that they possess the capacity to conceive and initiate interventions for the greater good of the world (Ooms et al., 2008; Hafner and Shiffman, 2013) However, the term "global health" lacks a clear understanding among actors in the field (Koplan et al., 2009; Sridhar, 2012; Chen et al., 2020). It holds different meanings for various individuals and organizations involved in global health, underscoring the need for critical reflection (Pfeiffer and Nichter, 2008; Koplan et al., 2009). This lack of consensus and discrepancy in the definitions of global health also contributes to an unclear understanding of global health research.

Definition of global health

The term "global health" has undergone progressive changes over time. It has been referred to by various names, such as community health, public health, primary health, international health, tropical medicine, and now, global health (Farmer, 2004; Kickbusch et al., 2007; Koplan et al., 2009; Chen et al., 2020). All these developments have been conceived, packaged, and disseminated by actors from the Global North or high-income countries, with the intention of implementation in the Global South or low- or lower-middle-income countries (LICs or LMICs). In this section, we aim to provide a concise summary of the key terms.

The term "global" refers to a comprehensive or holistic view of the world, encompassing a sense of alignment with one's goals and values, as well as the feeling that one's existence matters. This subjective sense of meaning or purpose in life consists of coherent perspectives, goals, values/beliefs, and a subjective sense of purpose (George and Park, 2017). The World Health Organization (WHO) defines health as a state of complete physical, mental, and social well-being, rather than merely the absence of disease or infirmity (World Health Organization, 1946). One definition of global health states that it pertains to the health of populations in a worldwide context (Beaglehole and Bonita, 2010). Another definition describes global health as an area of study, research, and practice that prioritizes improving health and achieving equity in health for all people worldwide (Salm et al., 2021). Over the years, Koplan et al. of the Consortium of Universities for Global Health (CUGH) Executive Board have proposed a definition of global health, hoping to distinguish it from previous definitions (Koplan et al., 2009). However, significant changes have occurred since then, including the Ebola and Covid-19 pandemics.

A recent paper "Transforming global health education during the COVID-19 era" presents perspectives from global health students (Krugman et al., 2022). It points out that global health educators missed a significant opportunity during the pandemic to transform global health education by fostering north–south collaboration and building partnerships.

The paper highlights current shortcomings in global health education curricula, particularly in fully integrating lessons from the COVID-19 pandemic. It emphasizes the perpetuation of power asymmetries in global health and the exclusion of critical perspectives, including those of Indigenous peoples. Positive changes in global health education have mainly arisen from the efforts of action-oriented educators and students committed to justice, equity, antiracism, decolonization, and anti-oppression.

The shift to online learning during the pandemic offered an opportunity for global health education to become more inclusive and explore new models that promote power redistribution and amplify marginalized voices through transnational collaborations and diverse perspectives, moving beyond the dominance of high-income country-based male voices (Atkins et al., 2021). Institutions have implemented diversity, equity, and inclusion committees and strategies to address global health issues. However, the paper indicates that such initiatives

often lack meaningful structural change and fail to impact policies and systemic environments.

The paper advocates for student-led organizing as a crucial approach to drive change in global health education. By involving educators and fostering solidarity, these efforts can connect individuals across institutions, nation-states, and disciplines, facilitating co-generative learning and action toward common goals (Atkins et al., 2021; Krugman et al., 2022).

Global health research

In the context of unclear understanding and interpretations, one possible outcome is the misapplication of aims, objectives, and activities in global health. This calls for a reflection on our limitations as actors deeply engaged in global health research and seeking equitable collaborations. Recent examples, such as the actions leading to the formation of "Black Lives Matter"(Ray et al., 2023) and the unequal distribution of COVID-19 vaccines, demonstrate a lack of human dignity. Some global health researchers from the Global North proposed conducting vaccine trials with negative connotations in Africa and other LMICs, implying that their lives may not matter (Tagoe et al., 2021; Ali et al., 2022). These proposals from actors with authority, power, and resources may lack human dignity.

Additionally, there was also a proposal to conduct Ebola trials in West Africa in 2014 (Thompson, 2021). Furthermore, the World Health Organization (WHO) failed to timely declare the Ebola outbreak a Public Health Emergency of International Concern (PHEIC), showing some lack of human dignity in responding to outbreaks in LMICs (Soghaier et al., 2015).

Global health research collaboration

Globally, research projects tend to favor partners from the Global North, resulting in inequitable collaborations in global health (Boum Ii et al., 2018; Charani et al., 2022) Inequities in global health research collaborations are also evident in the design, packaging, and implementation of projects from the Global North (Atuire and Hassoun, 2023; Green et al., 2023). Efforts have been made to address this practice by encouraging LMICs to serve as Principal Investigators (PI) and promoting shifts in authorship positions (Boum Ii et al., 2018; Rees et al., 2022; Pulford et al., 2023). Although efforts have been made, these measures are insufficient (Rees et al., 2022). Thus, the majority of research collaborations still heavily favor partners from the Global North (Mbaye et al., 2019). Additionally, resources for collaborations primarily come from HIC and their institutions, further exacerbating the power imbalance and control (Charani et al., 2022). Funding requirements often mandate a collaborator from the Global North, limiting the possibilities for South–South collaborations (Tindana et al., 2007; Ooms et al., 2008; Pratt and Hyder, 2016). This lack of resources and investment in global health research from authorities in LMICs hinders their engagement in equitable collaborations (Atuire and Hassoun, 2023).

The mindset of Global North and South collaborators also plays a role. The legacy of colonization has created mindset inequities in LMICs, leading to reluctance among actors in the Global South to collaborate with each other (John et al., 2016; Pratt and Hyder, 2016; Monette et al., 2021). Therefore, there is a need to address the mindset inequity between the Global North and South, moving beyond the concept of decolonizing global health, and focusing instead on the inclusion of human dignity in global health research collaboartion (Monette et al., 2021; Atuire, 2023; Atuire and Hassoun, 2023). Furthermore, collaborations among LMICs themselves are rare, primarily due to funding limitations and the lack of interest and investment in global health research within LMICs (Charani et al., 2022).

The diverse interests and varying capacities of collaborators lead to imbalances in research outcomes and hinder equitable collaborations. The current education system and mindset perpetuate inequitable research collaborations. The language of instruction and curriculum in many LMICs still reflect traces of colonization, impacting research interest and collaboration.

Capacity building and education also contribute to inequitable collaborations (Atuire, 2023). Institutions providing resources for research are primarily located in the Global North, creating a disparity in resource allocation (Tindana et al., 2007; Pratt and Hyder, 2016; Charani et al., 2022). Efforts to improve equity should consider the diverse interests and capacities of collaborators and recognize the contributions of Global South partners.

The outcome of research collaborations is often measured by the number and quality of publications, which can disadvantage Global South collaborators. Their contributions, such as commitment and dedication, often go unrecognized, and the research outcomes may not always be applicable to the contexts in which the research was conducted (Kickbusch et al., 2007; Kickbusch and Liu, 2022; Saleh et al., 2022). Political will and commitment to research are lacking in many LMICs, affecting their engagement in global health research (Kickbusch and Liu, 2022).

Discussion

This paper presents our view on a common understanding of global health research collaboration, which aims to provide answers and solutions for everyone in need, for the common good of humanity and better health and dignity. Current realities deviate from a mindset of human dignity. We believe that including human dignity in the definition improves the understanding and equity of global health research. In this paper, we propose to define global health as all actions and inactions aimed at addressing health needs and solutions within the context of human dignity for all people worldwide.

Global North partners should increase their efforts to raise awareness among all actors in the field of global health. Some have already taken steps in this direction, such as PI positions to partners from LMICs during grant applications (Pratt and Loff, 2014; Rees et al., 2022; Pulford et al., 2023). Another important initiative is advocating for LMIC members to be assigned first and last authorship positions based on merit. The decolonization of global health is a relevant and important movement, but more can be done to further improve and narrow the gap in equitable global health research collaborations.

To achieve this, Global North partners, who hold power and control resources, must actively work to raise awareness about equitable research collaborations (Tindana et al., 2007; Charani et al., 2022; Kickbusch and Liu, 2022). This should include training

programs for students, both from the Global North and South, focusing on equitable research collaborations that prioritize human dignity and equity. It is also crucial to provide training to funders, donors, and political leaders to promote equitable global health research collaborations. Efforts should be made to establish funding mechanisms for South–South collaborations within the Global South. Existing collaborations between the Global North and the Global South should also be strengthened and scaled up.

Addressing capacity building in LMICs and their institutions is an urgent priority. Researchers in LMICs often have multiple responsibilities and lack the necessary capacity, which affects their scientific output in terms of publications and article quality. Additional training opportunities are needed for early, mid, and late-career faculty members, each with different goals and needs. Capacity building is crucial, and additional training opportunities should be provided for researchers at different career stages.

Affirmative action should be taken to increase capacity building efforts. LMIC institutions should be supported in managing research funds and creating an enabling environment for mentoring.

Efforts to develop equitable research collaborations must include deliberate actions to free LMICs from the mindset influenced by colonial legacies. Both Global North and South actors need to change their mindsets. Furthermore, the focus of global health should extend to addressing health-related issues in both LMICs and HICs, striving for equitable access and utilization of health services (Kickbusch et al., 2007; Hafner and Shiffman, 2013). In this context, the term "decolonizing global health" may not be the most appropriate approach; instead, the focus should be on promoting human dignity inclusion in global health. The word "decolonization" can evoke negative memories of past negative activities, and considering the persistent disparities even in the midst of decolonization, it may raise concerns, especially among LMICs.

In the development of equitable research collaborations, appropriate acknowledgment should be given to Global South partners. Most publications are in English, which is one of the colonial legacies and can pose challenges for LMIC collaborators in articulating their thoughts during grant applications and manuscript preparation. Global North partners can adopt innovative approaches, such as holding oral discussions to allow Global South partners to contribute their thoughts during the interpretation and preparation stages of manuscript writing. The Global North partners can then assist in packaging these ideas in standard English for scientific audiences, enhancing the chances of publication acceptance. The recognition of "illiterate partners" for their invaluable contributions, commitment, and dedication is an important aspect of equitable research collaboration. Their immeasurable contributions such as commitment, and dedication should be acknowledged as a form of equitable research collaboration. A collective effort is required to increase collaborations between the Global North and the Global South, as well as within the Global South itself. These are essential steps toward achieving equitable research collaborations.

In conclusion, there is a need for actors in the field of global health to come up with a standardized definition that captures the essence of human dignity and equity. Urgent action is required to address the discrepancies that exist in Global Health research collaborations, ensuring that all actors embrace a mindset of human dignity and equity. This mindset should strive to improve the health of individuals in both high-income countries (HICs) and LMICs. Deploying new techniques and tools to areas where they are most needed is crucial for their effective implementation.

Data availability statement

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

Author contributions

MNA, FA, and DC conceived and designed the study. MB, JO-M, JAN, CS, and A-RM searched for the literature for the review. MNA and FA reviewed and drafted the manuscript. MB, DC, JO-M, JAN, CS, and A-RM reviewed it for scientific quality. All authors contributed to the article and approved the submitted version.

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Conflict of interest

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A toolkit for decolonizing global emergency medicine education

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One of the tenets of global emergency medicine (GEM) is to create equitable relationships between high-resource and resource-denied countries to promote emergency care for all. Health interventions proposed by those working in GEM too often lack input from local and indigenous communities result in "voluntourism," research authorship inequity, under-representation and under-valuation of technical expertise and lived experience of leaders from resource-denied countries. We present a decolonization toolkit with specific recommendations that target and disrupt counter-productive power dynamics in GEM education. We held a workshop at the 2022 Society for Academic Emergency Medicine Annual Meeting to collectively develop strategies to address inequalities and increase diversity in GEM education. GEM practitioners were divided into small groups representing five thematic areas and asked to identify specific action items to address inequities related to their theme. Following the workshop, a group of authors reviewed small group responses and data was divided into themed qualitative matrices and recommendations were revised based on targeted literature review. Five thematic areas discussed included access, awareness and cultural humility, language, representation, and recognition. Specific recommendations and action items were created to address inequities related to these themes which can be applied by individuals and institutions in both HICs and LMICs. Despite being a relatively new academic discipline, GEM has replicated colonial structures that are prevalent in global health. However, using targeted recommendations described in our toolkit, individuals, and institutions can build a new framework for GEM that actively combats structural vulnerabilities and academic inequities.

KEYWORDS

global health, global emergency medicine, decolonization of global health, health equity, global health education HICs and LICs

TABLE 1 Reflection prompts based on thematic areas.

Thematic area	Description	Prompts for reflection
Access	• Who teaches (level of experience, age), who receives educational opportunities	• How should we ensure equitable learning opportunities with learners from LMICs? • Who controls financing and memoranda of understanding (MOUs)?
Awareness/Cultural humility	• How we self-reflect and recognize neo-colonial power structures	• How do we prepare learners appropriately to learn/work abroad? • How do we incorporate decolonization concepts into educational programs?
Language	• How we talk about global health, language requirements for educational opportunities	• How do we talk / write about people in LMICs? • What languages are used in global EM?
Representation	• How we portray LMIC communities and communities of color • Who sets the agenda and priorities	• How are LMIC communities portrayed in educational projects? • How can learners document their experiences equitably? • Who defines project goals and needs?
Recognition	• How we promote and recognize leaders, determine where expertise is located	• Who receives recognition on educational projects? • How do we advance/elevate LMIC partners?

1. Introduction

"History is written by the victors," with the legacy of colonialism woven through the economics, politics, culture, history, and health of colonized societies. Consequently, global health policies and interventions often validate non-local perspectives and ignore indigenous expertise as well as local, historical, and socio-cultural factors. Global health has colonial roots, since its inception as "tropical medicine," which emerged primarily to support the functioning of the extractive colonial apparatus *via* maintaining the health of the occupying Westerners. By focusing narrowly on pathologies impacting colonists, tropical medicine became a reinforcing mechanism of power structures imposed by occupying peoples (Birn, 2009; Packard, 2016). Later, tropical medicine evolved into "international health," with continued focus on health conditions and hazards affecting HICs and then to the field of global health today (Smith, 2013).

Global Emergency Medicine (GEM), a relatively new sub-specialty at the intersection of global health and emergency medicine (EM), aims to support the delivery of emergency care globally through capacity strengthening, education, and clinical care in resource-limited areas and humanitarian emergencies (Birn, 2009; Markel, 2014; Packard, 2016; Kivlehan et al., 2022). Despite being a relatively new academic discipline, GEM has replicated similar colonial structures prevalent throughout the broader global health field, including unequal authorship representation, lack of locally driven projects, and poor representation of experts from low- and middle-income countries (LMICs)[1] in organizational leadership.

While a growing body of literature identifies and calls to challenge colonial power structures and "decolonize global health," few publications offer practical strategies on how to combat these inequities, particularly for educational initiatives. To address this gap, we created a Toolkit with recommendations and action items to equip individuals and academic institutions with strategies to disassemble colonial power structures in GEM education.

2. Toolkit preparation

The Society of Academic Emergency Medicine (SAEM) Global Emergency Medicine Academy (GEMA) held a workshop at the 2022 SAEM Annual Meeting to collectively develop strategies to address inequalities and increase diversity in GEM education. GEM practitioners were divided into small groups representing five thematic areas, which were developed previously by committee consensus and adapted from existing toolkits for decolonizing global health (Huq et al., 2021; University of Washington International Clinical Research Center, 2021). Groups were given a description of each theme and specific prompts for reflection (Table 1), after which groups identified specific barriers and action items for GEM education (Table 2). Following the workshop, a small group of authors reviewed the responses and data divided into themed qualitative matrices and recommendations based on targeted literature review of each specific theme.

3. Toolkit

3.1. Access

Access to educational opportunities varies widely based on trainees' origination from HIC or LMIC and are skewed towards those from HICs. Many HIC institutions offer international opportunities for trainees in LMICs. Similar exchange experiences are often unavailable to trainees and academics from LMICs despite documented benefits (Bodnar et al., 2015). Barriers to LMIC partners visiting HICs are related to strict HICs licensing and clearance criteria limiting international visitors, further exacerbated by COVID-19 travel restrictions. Additionally, the costs associated with transportation and housing in HICs are often prohibitive.

1 We use the term LMIC instead of other terms such as the "global south." All terms have limitations and to an extent may perpetuate power imbalances, but we must choose a term, within the limited language and have chosen LMIC.

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TABLE 2 Barriers, short term, and long-term action items.

Thematic area	Barriers	Short term action items	Long term action items
Access	• Lack of existing funding for visiting LMIC partners • Poor telecommunications limiting virtual didactic exchanges • Academic advancement relying on publishing in high impact journals, which may not be open access • Poor recognition of LMIC practitioner expertise by national and international organizations. • Lack of formal processes to improve equity in exchanges.	• Explore funding mechanisms to support educational placement for LMIC practitioners at HIC partner sites. • Invest in telecommunication and high-speed internet to increase virtual opportunities, and request specific funding for this infrastructure in education and research grants. • Share and promote lists of open access, high impact journals.	• Lobby national and international conference committees to increase speaker pools and invite more educators from underrepresented communities. • Create feedback mechanisms that allow partners in both HICs and LMICs to assess and adjust if opportunities are not shared equitably.
Awareness/Cultural Humility	• Constructs of care which are based on unilateral decision making, asymmetric influence, and external agendas. • Media and popular culture conventions that promote misleading or inaccurate information about groups • Predetermined ideas which inhibit one's ability to change their perception towards a culture. • Power structures which encourage local practitioners in LMICs to adopt the norms, practices and language of those in HICs, at the expense of their own local culture and practice	• Develop predeparture curricula for international rotations increase cultural humility • Hold international rotators accountable to pre-departure best practices and have corrective measures in place when lapses occur.	• Take local practitioners lead when developing rotation curriculum and objectives. • Encourage and formalize feedback on cultural sensitivity • Develop mentors who can partner with practitioners to share their experiences prior to their arrival in country
Language	• Language services remain cost prohibitive in many settings • Lack of knowledge and resources of culturally competent and appropriate use of language • Lack of time and preparation for interpretation and translation	• Support a shift in language and terminology used in global health • Educate others on the impact of their use of language • Consider the use of free translation/ interpretation resources when available • Review websites, materials, and branding to ensure alignment of language with equity goals and reducing power imbalances • Include designated time for language preparation before meetings and events	• Support language learning and working knowledge in other languages • Translate educational materials into additional locally appropriate languages • Provide professional translation services for partners
Representation	• Competing priorities within medical education may devalue global health education, compounded by slowing of international collaborations during the COVID-19 pandemic. • Long-held biases in medical education promoting stereotypes about communities in LMICs and people of color. • Relative ease of use of existing curricular material that may promote biases, vs. creation of new materials that reverses these biases • Limitations in available time of potential experts from LMICs for education, particularly in the context of high clinical and administrative workloads • Lack of compensation for time spent preparing or giving lectures, often viewed as voluntary service at many institutions • Time zone differences which limit scheduling international experts from sharing their expertise through virtual didactics	• Revise existing educational materials that reinforce negative biases and stereotypes of underrepresented communities • Create materials that incorporate exposure to diverse groups in a way that honors the individuality of their experience • Invite and actively encourage LMIC faculty to teach learners in the US, either in person or *via* virtual exchanges • Normalize flexibility in meeting scheduling to accommodate schedules in multiple time zones, including alternating meeting times or those outside of normal "business hours" in the US. • Leverage multiple communication streams, such as Whatsapp and others to enable close frequent communication among partners.	• Lobby curricular committees to incorporate global health education into educational programs. • Promote awareness among educators of biases in the way that communities of color are typically portrayed and encourage diversity within educational images and cases • Explore funding and compensation mechanisms that appropriately compensate educators, including lecturers from LMICs, for their time.

(Continued)

TABLE 2 (Continued)

Thematic area	Barriers	Short term action items	Long term action items
Recognition	• Promotion-related pressure to publish data quickly to maintain forward momentum on projects. • Grant limits that preclude continuation of projects or require HIC partnership. • Lack of funding for equity and capacity building. • Turn-over of personnel (faculty from both HICs and LMICs, as well as trainees). • Communication barriers including challenges in finding meeting times • High clinical and administrative workload of partners in LMICs.	• Use flexible timelines for research projects to accommodate LMIC schedules • Encourage communication with all partners to ensure timelines are realistic and appropriate division of labor is implemented • Share training resources and mentorship necessary for academic advancement and faculty development (for example - negotiation skills, time management, leadership etc.) • Consider nominating colleagues from LMICs for general awards in specialty societies or at national and international conferences	• Establish continuity of projects and avoid "one and done" projects • Diligent planning of large programs to intentionally carve out smaller projects for which multiple individuals, can serve as the principal investigator. • Incorporate equity and capacity building for LMIC researchers within grants • Develop training materials and resources for LMIC faculty advancement • Lobby promotion committees for reform in authorship (for example - encourage a model of co-authorship and educate institutional leadership on benefits of collaborative approaches). • Lobby funding organizations or other specialty societies to create specific grants and awards for individuals specifically from LMICs

Many trainees from HICs who visit LMICs expect to serve in a teaching role, either due to institutional suggestions or because of their own internal biases regarding the superiority of the education granted to them. Alternatively, scholars from LMICs, from trainees to well-established senior faculty, are much less frequently asked to serve as educators in HICs, even when they may hold the greatest experience. This common unidirectional model of HIC trainees traveling to LMIC sites perpetuates the colonial mentality present in GEM by viewing those from LMIC's as less capable or knowledgeable than those trained in HICs.

EM has long been on the vanguard in developing free-open access medical education (FOAMed). What began as an experimental way to share knowledge with peers not able to afford access to content from traditional publishers, has become a structured part of medical education with increased recognition as an equitable method of knowledge sharing between communities (Chan et al., 2020). However, in practice FOAMed continues to be primarily accessed by users in HICs. Increased creation of content specifically for users in LMICs and publication of content in languages other than English is much needed (Burkholder et al., 2018). Limited access to mobile devices, particularly among gender minorities (Jennings and Gagliardi, 2013), as well as high-speed internet may also drive decreased FOAMed utilization in LMICs (Burkholder et al., 2018), as a result creators should ensure content is available to be viewed offline and promote investments in wireless technology as part of funded projects. Additionally, a shift in remote learning brought on by COVID-19 has accelerated opportunities for sharing didactic lectures and other live educational experiences on virtual platforms. Similarly, researchers from HICs conduct research in LMICs, however, final results are often published behind high-cost journal paywalls making access difficult for LMIC colleagues.

Specific Recommendations:

1. Partnerships with physician exchanges should be bi-directional with opportunities created for both HICs and LMICs with equal allocation of resources for visitors from LMICs. GEM educators in HICs should aggressively lobby departmental leadership for improved funding and expanded responsibility for visiting rotators.
2. Build repositories of free or low-cost quality medical education available all learners.
3. Empower LMICs colleagues to generate context-specific content and allow for ease of distribution to the GEM community.
4. Improve access to research findings among LMIC practitioners by aiming to publish research and educational projects in open-access journals whenever possible.
5. Work to create feedback mechanisms and space for critical reflection to allow all stakeholders to identify and resolve inequalities in partnerships (Sayeed and Taylor, 2020; Sridhar et al., 2023).

3.2. Awareness/cultural humility

Cultural humility represents an individual commitment to self-critique and openness to others' self-definition (Tervalon and Murray-García, 1998). Moving from a mindset of cultural "competence" to one of cultural humility is an important step in the evolution of global work, especially when learning, teaching or caring for patients in another culture than one's own. The historic frame of cultural competence implies the existence of a discrete set of facts which, when mastered, supply the practitioner with skills needed to navigate a culture different from their own (Hook et al., 2013). In contrast, cultural humility suggests that cultural understanding lies beyond a discrete skill or set of facts, especially as it applies to specific individuals within a culture (Betancourt et al., 2003). Cultural humility works to respect that the lived experience may be different within and between cultures. While a broad understanding of cultural norms is important, a perspective of cultural humility encourages a posture of respect and openness to external perspectives, while working to create space for individual voices to see individuals within their singular histories, perspectives, and held beliefs (Tsuchida et al., 2023). This understanding can ideally underpin partnerships and patient care between individuals from different backgrounds.

Specific recommendations:

1. Prepare for work by learning about the local language, culture, beliefs, social, economic, and demographic factors.
2. Preparations will aid understanding of general patterns but will not replace knowledge of individuals within their particular histories and backgrounds.
3. Prioritize decision-making from LMIC partners with ideas and content creation led by LMICs colleagues.

3.3. Language

Language is an essential mechanism for communicating solutions to global health challenges but is challenged and shadowed by colonial language perpetuating colonial structures, biases, and prejudices. Words such as "beneficiary," "third world," "global south," and "developing," result in a loss of agency and create and/or perpetuate inequitable power structures. Additional examples include "helping" rather than "partnering" or "in the field" rather than the actual location in another country (e.g., a classroom or a clinic). Turning the focus around to represent the realities more accurately - i.e., "resource-denied" rather than "resource poor" can vastly change power dynamics facilitating the breakdown of colonial structures and acknowledges the exploitative history that has often led to imbalances of resources (University of Washington International Clinical Research Center, 2021). Changes in language should permeate all aspects of global health work. Due to the fluidity of language, the understanding of how specific terminology either reinforces or disrupts harmful power structures will change over time, and should be led by indigenous and formerly colonized peoples who are most likely to be harmed by it (Hommes et al., 2021; Opara, 2021). Furthermore, non-verbal communication such as pictures or other graphics must not perpetuate colonial structures and power inequities (Huq et al., 2021).

It is not by chance that the most common languages in global health are traditionally colonial languages: English and French, with most journals, text books, and other educational materials today being published in English (Hommes et al., 2021). Choice of primary language should be an open discussion with local partners, and care should be taken to avoid comments about language ability, which are common microaggressions in global work (University of Washington International Clinical Research Center, 2021). Additionally, interpretation should be offered and expected in conversations, and individuals should not be excluded based on language abilities. The choice of working language(s), as well as the words and designations used within those languages, should be discussed throughout partnerships in global health to ensure mutual respect and equity.

Specific recommendations:

1. Promote the consistent use of language that seeks to reduce power imbalances, avoid dehumanizing, derogatory, and patronizing terminology, developed through local partnership and collaboration.
2. Institutions should critically analyze their language, branding, photos, graphics and other media - with a focus on both verbal and non-verbal communication - and align their messaging with locally appropriate language and imagery.
3. Provide environments that support all partners' primary language(s) and accommodate for translation both in their home country and abroad.
4. The research community should provide resources that allow for publications to be published in authors' primary language(s) and offer interpretation.
5. Institutions offering experiential curricula for students/trainees should incorporate primary language(s) of sites as well as principles and best practices in cross-cultural communication.

3.4. Representation

Although race is a social construct with biologic consequences, rather than a meaningful biologic/scientific construct, medical education often does not reflect this understanding (Amutah et al., 2021). Reviews of medical school curricula have shown significant misrepresentations of race, using imprecise or antiquated labels to convey complex biologic or genetic trends, or presenting racial and ethnic differences in disease prevalence without context (Amutah et al., 2021). Medical school curricula suffer from a lack of representation of people of color in both textbooks and didactic instruction. In medical illustrations, white, male, cis-gender patients often serve as the default example, and when patients of other races, genders, and sexual orientation are presented it is often to illustrate associations between disease and specific ethnic and racial categories (Nieblas-Bedolla et al., 2020; Ilic et al., 2022). This can lead to race-based diagnostic bias that pathologizes race (Amutah et al., 2021). Unsurprisingly, a substantial number of US medical students and trainees hold false beliefs about racial and ethnic differences (Hoffman et al., 2016).

Data on representation of immigrant communities in medical education is more limited but is thought to be at high risk for negative bias due to the intersectionality between race, ethnicity, and migration

(Hall et al., 2015). Similar to non-white populations in the US, when patients who are immigrants or refugees are presented as cases in pre-clinical medical education, it is often to illustrate a potential tropical disease not typically seen in the US, which can lead to diagnostic bias towards "exotic diseases" in these groups and against more common conditions that may be unrelated to their immigrant status. Meanwhile, refugee and immigrant communities face unique health challenges related to access to care, language barriers, and global health epidemiology. Increased exposure to global health curricula, particularly those focused on cultural humility and immigrant health, can better equip healthcare workers to address healthcare disparities in migrants and refugees (Gruner et al., 2022).

Specific recommendations:

1. Medical education should increase exposure to global health for trainees from HICs, including perspectives of LMIC communities and communities of color. Specific attention should be paid to address underlying themes of "white saviorism" that are pervasive in discussions of global health partnerships and international aid.
2. GEM educators should beware of reinforcing biases against immigrant communities and communities of color that are pervasive within medical education. Immigrants and people of color should be included in case-based learning, including in cases unrelated to ethnicity or country of origin.
3. Experts in EM should be given national and international opportunities to share their specialized knowledge regardless of their country of origin. Educational exchanges involving didactics should encourage educators from both HICs and LMICs to share their specific knowledge and experiences with learners.
4. Ensure that local collaborators' perspectives and priorities are considered throughout research or educational projects, and increase opportunities for trainees and faculty from LMICs to publish and take an active role in research.

3.5. Recognition

EM is a relatively new specialty with the majority of specialty-specific advancement and influential societies based in HICs where the specialty first originated in the 1960s–1980s (Alagappan et al., 2007). This creates an environment where work done by LMIC experts is usually not acknowledged on the global stage due to the early stage of EM development in many LMICs. There is sometimes pressure on LMIC experts to partner with HIC experts to bring attention to work that they developed and led in their home countries.

In particular, authors from LMICs are underrepresented in the broader global health literature, most notably in the lead author positions (first and last author) which have the greatest impact on academic advancement and grant funding (Sumathipala et al., 2004; Ghani et al., 2020). Within GEM specifically, recent analysis of studies within the annual Global Emergency Medicine Literature Review (GEMLR) from 2016 to 2020 found that in research conducted in LMICs, authors affiliated with high-income countries (HICs) were represented more often and were more likely to be in lead author positions than those from LMICs. Additionally, evidence of author "parasitism," in which a study conducted in a LMIC had no authors from the study country was not uncommon (Garbern et al., 2022).

There are limited opportunities for development of leadership and other academic skills for EM faculty from LMICs (Keiller et al., 2022), where newly trained faculty often have heavy clinical workloads, lack protected time for developing medical education skills, and lack mentorship to advance their careers. Therefore, LMIC faculty may feel poorly equipped to lead academic and training program advancements in their home countries (Douglass and Williams, 2019). Improving the availability of these resources could lead to more visibility and thus more recognition of LMIC experts.

Having LMIC faculty hold joint academic appointments at HIC institutions, in a similar manner as many HIC faculty do with LMIC institutions, can increase opportunities for LMIC leaders in education and academia to be recognized. Reversing the often uni-directional flows of academic funding and knowledge, promoting the unique and valuable perspectives of indigenous scholars, can lead to more equitable global health partnerships (Adams et al., 2016; Karim et al., 2020; Eichbaum et al., 2021).

Specific Recommendations:

1. Decolonization in GEM should be mindful of structures within academia that promote inequities in authorship and attempts made to challenge those structures. When developing manuscripts, attempt meaningfully engagement with LMIC partners and credit them with either first or last author positions. Because factors affecting academic advancement can vary widely by institution and country, HIC authors should also be aware of how authorship position is viewed by the institutions of their partners and advocate for the importance of partnerships to promotion committees.
2. Increase recognition of partners from LMICs for their work through nominations for national and international awards. Physicians from LMICs should be considered for nomination awards granted by organizations based in all income countries. This recognition can start with nomination for existing awards; however, specialty societies should consider creating awards specifically geared towards partners from LMICs.
3. Share and develop resources on skills necessary for academic advancement and faculty development that are culturally and context appropriate.

4. Discussion

Despite its colonial legacy, tremendous opportunity exists to center the field of GEM on practices informed by the core principles of equity and justice. With a broad global literature base examining philosophical and sociological approaches to decolonization, it is now up to practitioners of GEM to translate knowledge into action. As the GEM community has begun to critically analyze the colonial legacy within its specialty, Access, Representation, Cultural Humility, Language, and Recognition stand out as impactful themes.

We hope that this toolkit can serve as a starting point, a guide, and an impetus for change. While use of the toolkit is not meant to be prescriptive, we provide some suggested methods to implement the

toolkit. Regarding the end-user, the toolkit may be used for both individual or group activities to critically examine the current state of existing educational projects and serve as a guide to direct future more equitable initiatives. We encourage representation from all partners to ensure diverse voices are heard and a truly collaborative rather than uni-directional strategy exists to overcome barriers. Our current work is limited by the composition of our writing group which disproportionately includes authors affiliated with institutions in the US, and we acknowledge that there may be additional strategies or considerations missing from our HIC-weighted perspective. As a result, revisiting the toolkit regularly is suggested, perhaps on a semi-annual basis and with increasing involvement of practitioners from LMICs, to track progress and ensure accountability to stated goals, and create additional themes as relevant to one's own work as they arise using the toolkit's framework.

With respect to Access and Representation, we strongly endorse bidirectional knowledge transfer, educational and travel opportunities, freely accessible medical education, and research, emphasizing the expertise and perspectives of EM leaders in LMICs. Some recent examples demonstrating positive changes in the GEM field include resources from the African Federation of Emergency Medicine (AFEM) (African Federation of Emergency Medicine, 2021). AFEM provides comprehensive EM educational and clinical resources that are open access, free, and implemented worldwide. An additional two examples are found within the University of California San Francisco (UCSF) specialty-independent Health, Equity, Action, and Leadership (HEAL) (Heal Initiative, 2023) fellowship, which aims to develop bidirectional education, interprofessional exchange, and partnership-based sustainable work over multi-year assignments. Simultaneously, UCSF has created a Center for Health Equity in Surgery and Anesthesia, which focuses on local and global health equity featuring bidirectional research, advocacy, education, and training (Center for Health Equity in Surgery and Anesthesia, 2023). These frameworks, put into practice by AFEM and UCSF, can be easily molded to other global health initiatives.

Considering Cultural Humility and Language, we encourage practitioners and institutions to reconceptualize how GEM academic projects are conducted. Practitioners should develop cultural competence while simultaneously aspiring to the ideals of cultural humility. We simultaneously recommend equitable usage of working languages and interpretation so that all patients, communities, and partners have an equal voice. We therefore recommend care in employing verbal and non-verbal communication that encourages agency, equity, and is defined by those that it describes.

Finally, with respect to Recognition, we recommend an approach that understands differing cultural contexts surrounding professional advancement, encourages equal access to research opportunities and accolades, collaboratively shares and develops skills, and seeks to both fund and recognize individuals from LMICs for their achievements. While authorship inequity is reflective of deep systemic inequities in GEM research and funding, the GEMLR group recently took an important step toward promoting authorship equity by implementing an article scoring criteria to award additional points if authors have an affiliation in the country where the research was performed. Future steps might include further emphasis on author blocks that contain local researchers in the first and last author positions and ensuring LMIC scholars have equitable representation on global health and GEM journal editorial boards.

Lastly, we encourage thoughtful, respectful dialog to promote more equitable, meaningful partnerships.

Data availability statement

The original contributions presented in the study are included in the article/Supplementary material, further inquiries can be directed to the corresponding author.

Author contributions

CG, SG, and MM: substantial contributions to the conception or design of the work, or the acquisition, analysis, or interpretation of data for the work. JL, MR, KT, TD, AdA, TW, NK, FA, AhA, SP, CG, AD, SG, and MM: drafting the work or revising it critically for important intellectual content. All authors contributed to the article and approved the submitted version.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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ACCESS model: a step toward an empowerment model in global health education

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The approaches to global health (GH) partnerships are as varied as the programs available across the globe. Few models have shared their philosophy and structure in sufficient detail to inform a full spectrum of how these collaborations are formed. Although contributions from low- to middle-income countries (LMICs) have markedly grown over the last decade, they are still few in comparison to those from high-income countries (HICs). In this article, we share the African Community Center for Social Sustainability (ACCESS) model of GH education through the lenses of grassroots implementers and their international collaborators. This model involves the identification and prioritization of the needs of the community, including but not limited to healthcare. We invite international partners to align with and participate in learning from and, when appropriate, becoming part of the solution. We share successes, challenges, and takeaways while offering recommendations for consideration when establishing community-driven GH programs.

KEYWORDS

global health education, ACCESS-Uganda model, decolonization, infrastructure, learning

Introduction

From its inception, the field of global health (GH) has been and continues to be defined and redefined, from its colonial roots to its neo-colonial present. GH can be understood as an area for study, research, and practice that places a priority on improving health and achieving equity in health for all people worldwide (Koplan et al., 2009). Here, we focus our discussion on GH education, specifically the hosting of medical students, residents, faculty, and physicians from high-income countries (HICs) in low- to middle-income countries (LMICs) during short-term clinical GH electives.

It is generally well understood that, despite touting mutuality and bidirectionality, most such partnerships are largely unidirectional and molded to their colonial beginnings. The task of "decolonization" is not only colossal but perhaps even impossible in a global framework in which all systems, from economic to social, are essentially colonial.

The question of how to co-create and sustain GH partnerships in light of history, our experiences with past and current partnerships, and the social injustices that have been highlighted during the COVID-19 pandemic continues to resound. We hope to identify means of surpassing verbal calls for change and engage in actions that will allow us to move toward a shared vision. We need broad participation in this effort, from GH educators to the countless other overlapping sectors (Lu et al., 2021).

What we are up against is a well-entrenched narrative perpetuated by the media that overlooks Africa's richness, instead depicting the continent as resource-poor, a claim often over-exaggerated by participants in short-term GH electives (Bishop and Litch, 2000). When faculty and students from HICs visit LMICs, they find widespread poverty, poorly run institutions, corruption, fragile health systems, under-resourced health facilities, lack of basic health services, and professionals who seem inadequately trained and at times apathetic for the tasks they perform. In a tragic demonstration of confirmation bias, their eyes are trained to mainly observe what they think they already know. They often enter with the notion that they are "helping" by casting a set of fresh, knowledgeable eyes on a complex problem.

On the other hand, when faculty and students from LMICs visit HICs, they find people living in the lap of luxury with well-run institutions, robust and sophisticated health systems, well-resourced health facilities, quality healthcare, and highly trained professionals, with their knowledge and contributions too often underestimated. This imbalance reinforces the superiority/inferiority complex: the belief that leadership, institutions, values, culture, and other resources should be imported from HICs to develop LMICs (Kruk et al., 2018).

At first glance, visitors may find our system disorganized. They may even question our level of investment in our community. They identify multiple gaps across different sections of the health delivery system and independently offer spontaneous solutions, often transplanting ideas based on their experiences in HICs. What they fail to see is how our systems were developed to optimize the resources we know and trust.

We share our local resources with GH participants to help them appreciate that we do have resources that best align with the community's needs, though they may be different from those found in HICs. We have found means to put our resources to the best use, and they often do the job well. We try to dispel the myths of Africa as resource-poor by providing participants with direct experiences of its richness. We make it clear that the role of visitors who work with us in LMICs is to collaboratively identify available resources and use them appropriately and judiciously.

We prepare the visitors using extensive pre-departure orientation and education in GH's colonial history, bias, racism, inequality, poverty, and power structures, as well as simulations of difficult conversations around these topics based on on-the-ground experiences. To help nurture more open mindsets, we have compiled a case-based module based on our experiences with previous visitors' dilemmas for use as a teaching opportunity to help visitors understand the roots and realities of some of their observations. This article is centered on what ACCESS has done to work toward setting up a model GH program that is beneficial to visitors from HICs and hosts in LMICs alike.

The ACCESS model: roots

Unlike most GH programs that are run by major universities, ACCESS is a grassroots organization started by a group of community members who sought a holistic approach to addressing challenges faced in their community. Located in Nakaseke, a rural district approximately 65 km from Uganda's capital city of Kampala, our community consists largely of subsistence farmers.

ACCESS' origins as a health clinic serving patients living with HIV/AIDS were slow to start, as stigma kept patients at home, never seeking help. However, the program, through education by community health workers (CHWs), drama groups, and other outreach programs, transformed the community's attitude in Nakaseke so that the clinic became a site for the provision of general healthcare. Health awareness increased substantially, with patients now visiting the ACCESS clinic daily and an annual health day drawing thousands of residents for free consultations and treatment.

Since its inception, ACCESS has added three additional components: the CHWs training program, the ACCESS Nurses and Midwifery School, and Grace's Promise Preschool. To date, we have trained over 300 CHWs. These individuals are volunteers from local communities who assess, identify, and refer individuals for clinical and other services, including transportation to and from the hospital or clinic and offering in-home first-aid services. They also identify children from families affected by HIV/AIDS and provide them with support in the form of medication, nutritional supplements, and school tuition and materials. We also provide income-generating services such as cattle or gardens for their families. In this way, ACCESS supports healthy living from a multi-faceted perspective.

In Uganda, approximately 80% of the healthcare workforce lives in big towns, which constitute only 20% of the population. ACCESS sought to address this imbalance by setting up a training program based in Nakaseke. Originally a nursing assistant school, the nationally accredited ACCESS Nurses and Midwifery School in collaboration with Nakaseke District Hospital aims to improve access to medical services in underserved areas of Uganda. The majority of its graduates are incentivized to remain in rural areas to work and give back to their community (Sadigh et al., 2017). Additionally, ACCESS is located on 17 acres of land where all the activities are interlinked. This provides an opportunity for students to experience the serene environment surrounded by gardens, including gardens to grow food that enriches the diet of both the local community and international visitors.

Healthcare delivery

ACCESS provides health services throughout a person's lifespan. ACCESS offers both outpatient and inpatient medical services as well as community outreach through the medical mobile team and community-based health workers. As with previous years, in 2022, we served 446 pregnant women, immunized 1,575 children, and tested 3,185 children for malaria, of whom we treated 1,659 individuals. We offered health education to 46,064

individuals and provided outpatient services to 7,691 patients, with 287 patients admitted for an average of 5.6 days of hospital stay. The top four causes of admission in children were malaria, respiratory tract infections, diarrhea, and malnutrition. Adults were treated for both infections and non-communicable diseases (NCDs). We offered 3,853 laboratory tests including kidney function tests, liver function tests, urinalysis, HIV, malaria, and other infectious screening tests, at the health facility, helping clinicians with the diagnosis. In addition, we performed 336 ultrasound scans (235–70% women) to aid in diagnosis using a visiting radiographer.

Working with 125 CHWs and the mobile clinic, we offer primary healthcare services, including disease prevention and health promotion. In 2022, we offered 44 community visits, reaching out to 146,064 individuals and providing family planning services to 38,086 women and men. The most common challenges for the youth were sexually transmitted infections as well as malaria and respiratory tract infections. Through our research collaboration, we screened 3,500 individuals for hypertension, high blood sugar, kidney disease, and chronic obstructive airway disease. Using the same CHW model, we were able to screen 786 women over 35 years of age for cervical cancer using an innovative self-administered cervical brush. These services are offered in line with guidelines from the Uganda Ministry of Health.

Programmatic elements

At ACCESS Uganda, we have empowered our people through three key areas: education, healthcare, and economic promotion. Our model involves the identification and prioritization of the needs of our community. We identify and support vulnerable children, providing them with a general education and employable skills. We have established a healthcare facility called the Lifecare Center, which works with 18 Ugandan government-supported facilities to deliver both outpatient and inpatient services as well as preventive services as outlined above.

We economically empower families by teaching them subsistence skills and financial literacy while providing them with interest-free loans and projects that enable them to eradicate poverty and provide their families with basic needs. We invite international partners to align with community-based projects and become part of the solution. This promotes indigenous solutions through cross-pollination with international partners' contributions. Our model involves the identification of the community's needs, which are verified by community gatekeepers before solutions are implemented and scaled up for impact with the help of local and international partners (see Figure 1).

Over the past 12 years, we have partnered with several individuals and institutions in HICs through a variety of exchange programs. We have hosted faculty, residents, fellows, and medical students, and we have also sent a few of our faculty to HIC partners' institutions in order to provide a reciprocal learning experience. The needs of our community are always at the forefront when enacting reciprocal exchange. We believe that with direct exposure to our culture and language, visitors gain a deeper understanding of who we are and are therefore less likely to misuse their perceived knowledge and skills in harmful ways. We teach them how to conduct clinical exams and make home visits in villages where patients and other vulnerable individuals live, so they can experience the entire spectrum of health and its determinants. By offering simple local language lessons, our hope is to bring out the human touch through authentic and culturally sensitive interactions with our beneficiaries. To date, we have hosted 25 faculty and 56 international residents and students who have visited ACCESS for 2–6 weeks. Our goal is to offer a learning environment in which there is a respectful exchange between local staff and our visitors.

We have also had six of our faculty visit our partner institutions in the USA and Germany for 2 weeks—a length of time that is of course suboptimal, and we are presently in discussions with our collaborators to fund longer periods to allow more effective human capacity building of our team members. Given the structural and legal constraints of hosting LMIC faculty in HICs for clinical rotations, such as the fact that international healthcare workers cannot practice medicine in the United States, it may in some ways be a better use of time and resources for HIC faculty to come to LMIC sites for capacity building of human resources directly on-site at ACCESS. As such, our partners have sent faculty to teach nursing students and collaborate on curriculum building at ACCESS, as well as teach palliative care courses, implement programs for women's and children's health, and improve patient awareness of NCDs and HIV.

While reciprocal hosting of our faculty in HICs is absolutely an important metric of equity in our partnerships, it is not the only one. Our partners in HICs have invested ample financial resources in addressing the needs of our community. From the provision of laptops and learning materials to the ACCESS Nursing School to the establishment and maintenance of Grace's Promise preschool which serves the entire district, and from the construction of modern living quarters at ACCESS to covering the entire cost of travel and lodging for our faculty in HICs, our partners help us achieve goals that are set by our community, for our community.

Furthermore, part of the reciprocity in our partnerships is seen in our HIC partners connecting us to podiums on which to work collaboratively and amplify our voices, our skills, and our creativity, as well as the needs of our communities. Members of ACCESS have been hosted in the United States to speak to a greater community of donors and attract funding for initiatives, and to speak on panels at various conferences; last year, we were given the podium by our partners to speak collaboratively on a panel at the United Nations General Assembly.

The role of students

Students can be pivotal stakeholders in ensuring the sustainability and success of GH programs through a thought-provoking paradigm. On the one hand, LMIC organizations such as ACCESS are put in the position of dedicating extra time and resources to hosting and teaching visiting students and faculty, an action that inevitably involves a certain level of disruption to the local community. It is impossible to predict visitors' mindsets and behaviors, even with the most extensive participant selection, pre-departure orientation, and on-the-ground support. Bringing individuals from HICs into communities that are harmed by

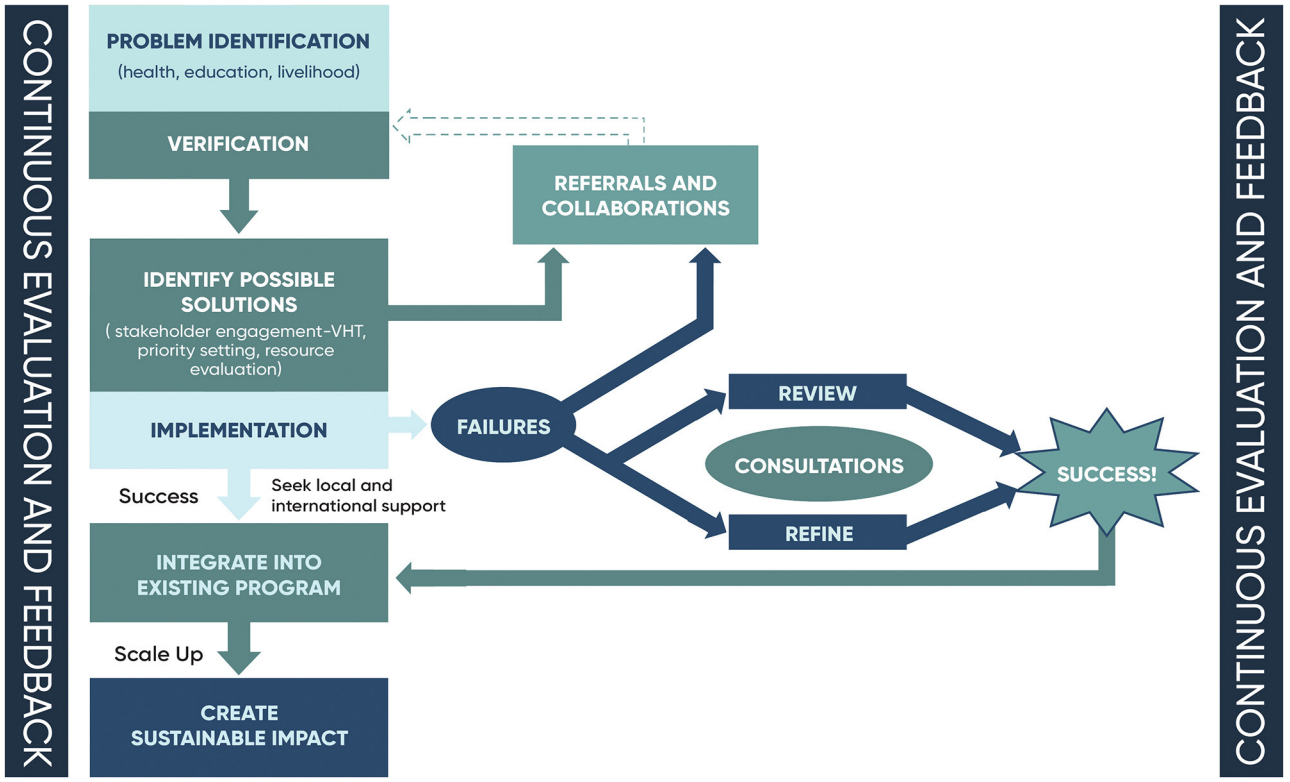

FIGURE 1
ACCESS model of community engagement to sustainable impact.

a continued history of the colonial mindset is an inherently vulnerable task. On the other hand, when performed with transparency, continued conversation, and intentionality, the act of inviting visitors into community life can help dispel the colonial mindset and ultimately help empower communities in LMICs, as visitors may help amplify LMIC voices on return to their home countries and thereby restructure the narrative.

That being said, it is difficult to predict what participants' takeaways from the experience will be. Our approach is two-fold: first, trying to prevent harm, and second, striving to encourage a narrative shift. Components of harm prevention have been mentioned in our summary of pre-departure training, which also includes important discussions around depictions of our community through photographs and social media use. During their stay, participants are also asked to write weekly reflections about their experiences, which are shared with the team and help us assess the ways in which any participant may be struggling and need support, while also identifying areas where a participant may need extra discussion or direction in processing their experiences through a clearer lens.

The evolution toward a narrative shift is an equally, if not more, challenging endeavor, and one that is still in progress. While our collective observations have shown us that overall, participants experience an overturning of their pre-held beliefs and return home with a meaningful appreciation for our culture, community, resources, skills, and resourcefulness—an evolution that is often apparent through participants' written reflections—we have yet to quantifiably measure this impact. Conducting a study of participants' biases and beliefs prior to and following this GH experience may be valuable, as well as more deeply and intentionally incorporating the concepts of narrative and storytelling in reflection so that participants can begin to think meaningfully about how to best represent their experience with us on their return home.

In summary, hosting students involves a careful and constantly evolving balancing act among not putting too much strain on the host community's time and resources, preventing possible harm from participants to the community, and finding creative ways of capitalizing on the notion that intentional and carefully curated experiences for HIC members in our community may help dispel long-standing myths and misconceptions. At ACCESS, we are continually in the process of seeking creative means of evolving these concepts.

A reasonable question that we believe all participants in GH exchanges should ponder is whether the hosting of international participants is ultimately of benefit to host communities—or rather, of greater benefit than putting those same resources directly into the community itself. The reality for us is that while we pride ourselves on the resources we do have and our skills in utilizing them, we are constrained in ways that are difficult to manage without the engagement of international participants. In

the following section, we describe collaborative projects that helped improve the quality of life and health in our community.

Successful projects

By aligning the needs of our community with visitor's interests, we have been able to work with our partners to impact lasting change. For example, until 2016, Nakaseke lacked schooling for children under the age of five. We worked with Grace Herrick, a visiting high school student from the United States, who identified this as a key need and worked with local community members and international donors to establish Grace's Promise. This early childhood development program has graduated 230 pupils to date and has garnered support from international NGOs like ELMA Philanthropies, Segal Family Foundation, and IZUMI Foundation. It has now become a model center for early childhood development programs in Nakaseke, ensuring that children between 2 and 6 years old have a place to learn and play. Visiting students also have the opportunity to interact with children and participate in their care if it aligns with their interests. This school has played a pivotal role in the wellbeing of our community. UNICEF has noted that early childhood development programs are most beneficial for children from disadvantaged families and offer significant benefits in lowering inequalities between peers (UNICEF, 2021).

We unfortunately lacked clinics that were well-equipped to manage NCDs, which are a major threat to our community, with one in four adults having high blood pressure. To help address this epidemic, we collaborated with Charite and Heidelberg University in Germany, Nuvance Health/University of Vermont Larner College of Medicine (UVMLCOM), Johns Hopkins GH Program, Yale University, and Partners for ACCESS, all in the USA, as well as Makerere University in Uganda, to establish a center of excellence in the management of NCDs in Nakaseke. Through this collaboration, we have trained CHWs to screen for hypertension, diabetes, chronic lung diseases, and kidney diseases. Patients identified by CHWs are referred for further management to health facilities. This project has so far screened 16,000 individuals and established three NCD clinics, two of which are currently supported by the Uganda Ministry of Health. We currently provide care for 960 patients with NCDs and have several research projects focused on the prevention and management of NCDs in rural communities (Chang et al., 2019; Siddharthan et al., 2021; Tusubira et al., 2021; Moor et al., 2022). International students, residents, and faculty participate in the development of protocols, treatment guidelines, training materials, student education, research, and publication as well as patient management during their stay at ACCESS.

Among the noteworthy contributions from visiting GH students is that of a UVMLCOM team that facilitated the now highly utilized PEP (post-exposure prophylaxis) project introduced to Nakaseke Hospital personnel. Another is the provision of 54 solar flashlights to rural children by an American faculty to extend their reading hours beyond the limits of daylight. CHWs and social workers who monitored the academic progress of solar torchlight recipients observed substantial improvement in the children's school performances. Working with faculty from Germany and the United States, we set up the PocketDoctor® booklet, which has been translated into the local Luganda language and used to improve patient awareness of NCDs and HIV (Siddharthan et al., 2016; Batte et al., 2021). Having been adopted by several partners, this booklet is currently being utilized in several districts in Uganda. We have collaboratively developed a patient-centered model of NCD care that involves the delivery of care to families by CHWs supported by static clinics and a mobile team of clinicians based on our community's needs.

The Women's GH team from UVMLCOM collaborated with Nakaseke community members to study the role of incentives in increasing family planning access among women of childbearing age in Nakaseke, as many women previously lacked access to prenatal care (Dougherty et al., 2018). Additionally, a group of public health students and faculty from Touro University have worked with the ACCESS team in Uganda to study youths' perceptions of the reception of family planning services by CHWs (Kalyesubula et al., 2021).

We have developed a comprehensive core curriculum delivered by ACCESS and Nakaseke Hospital staff to cater to the needs of GH students while maintaining a focus on the interests of our patients. The curriculum consists of orientation modules and modules on health systems and policy, tropical medicine, NCDs, cultural competence, clinical teaching (bedside teaching), and home visits. We believe that this curriculum with its practical sessions offers a 360-degree view of health and healthcare in rural settings.

Students are often housed on the ACCESS campus, where they interact with ACCESS staff and regularly interface with our beneficiaries. Those who intend to participate in research activities need to identify a topic of choice in collaboration with their home faculty and an in-house faculty. This ensures that all the necessary ethical approvals are obtained before research is conducted for primary data collection. We have also, on occasion, worked with students to use secondary data to address issues that have been identified by the ACCESS community members as important. We hold regular meetings with students to ensure that we address any matters arising on a day-to-day basis and also encourage students to write reflections that are often shared with the faculty. Each student receives a participatory mid-evaluation and a final evaluation as required by their primary institution. Students are further supported by their home institutions through a post-return debriefing and are encouraged to become long-term GH scholars.

Discussion: practical implications and lessons learned for future applications

There are certain core lessons we have learned over time and rely on to run an effective GH program (Figure 2).

Leveraging locally generated resources and infrastructure for local needs-based care.

At ACCESS, we are clear on what our local needs are and what we bring to the table. We have used our locally generated resources to create strong physical and leadership structures. We have buildings, computers, and staff that are well-trained in our focused areas. Given that many donors do not fund infrastructure developments, we have relied heavily on our local resources until outside sources were identified. We have a unique set of patients who are often very willing to welcome learners

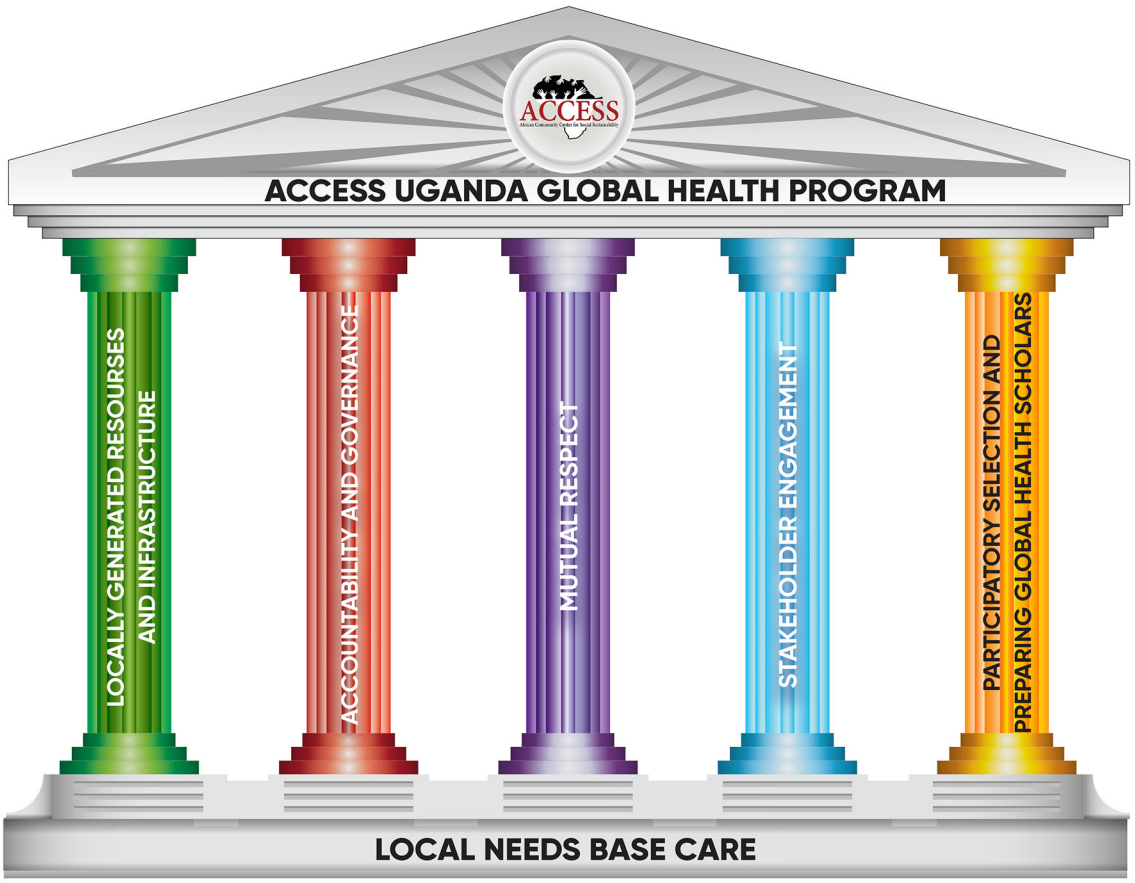

FIGURE 2
Summary of key lessons learned through the ACCESS model of focusing on local needs for global health.

into their communities and even their personal spaces for home visits. Our network of CHWs and other community structures is maintained by equipping them with the necessary skills to manage health, educational, and social issues in the community. We have developed a comprehensive GH curriculum that has been enriched by our partners to address the needs of both local and international institutions.

Infrastructure development presents an Achilles heel for GH programs because it is both labor- and finance-intensive. The holistic model at ACCESS embraces the areas of health, education, and economic empowerment supported by international partners (see Figure 3).

We have employed various tactics to garner resources from our partners for infrastructure. The key has been stating to funders what we need upfront. For instance, the guest house for local and international students was built with support from an international partner who wanted international students to have "special accommodation." We entered into an agreement to host their students for 5 years if they built a modern guest house, which they did (see Appendix 1).

The second approach we have utilized is encouraging international partner organizations to mobilize teams and resources to participate in setting up memorial infrastructure in our community. The first classroom block for the ACCESS Nursing School was built by a team of volunteers led by Partners for ACCESS from the United States. It now houses 40 nursing students in a boarding section (see Appendix 2).

Our third approach has been directly contacting organizations that work in building infrastructure for resource-limited settings. Our women's hospital was built with support from Construction for Change (C4C), which financed 80% of the work and sent two experts to stay with ACCESS for a year (see Appendix 3). The remaining 20% for the construction of the women's hospital was met by another partner called The Erik E. and Edith H. Bergstrom Foundation, which also funded an operational theater for family planning.

The fourth method we have utilized in building our infrastructure involves encouraging families and groups of visiting local and international students to make a difference and start chapters that support the work we do at ACCESS. In this respect, Grace's Promise was born and has spearheaded the construction of the best preschool in Nakaseke district (see Appendix 4). Last but not least, we have had the privilege of working with funders who offer unrestricted grants, which have served as a key input, to which we have added our own generated resources toward ensuring the expansion of much-needed infrastructure at ACCESS.

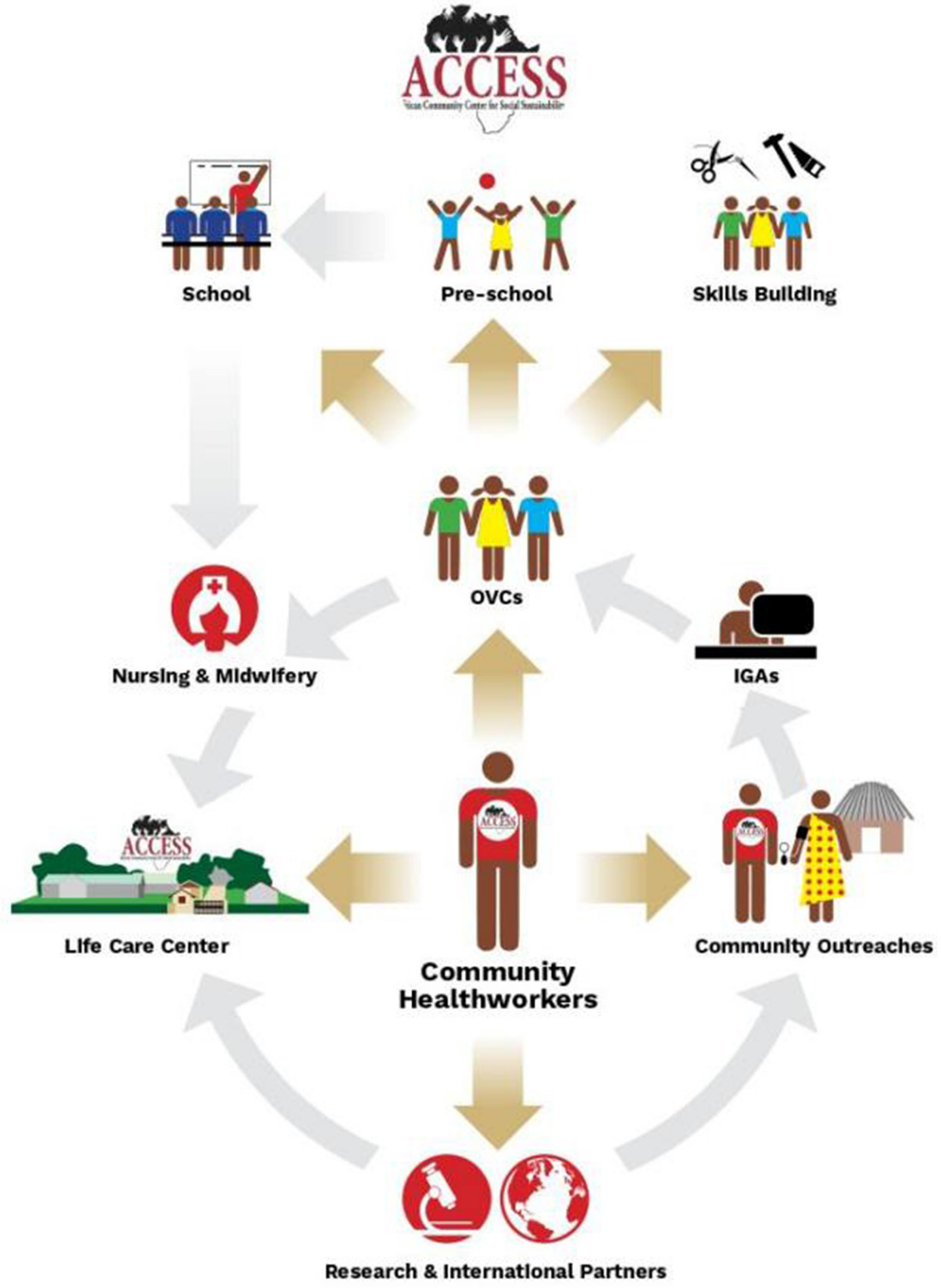

FIGURE 3
ACCESS holistic approach to health, education, and community empowerment. The approach is based on the community health workers who are the center bolt for all the activities that are carried out by the organization, linking international partners to the community.

Accountability and governance

Our nine-member management committee, identified by district leadership, ACCESS management, and international partners, consists of experts in education, governance, finance, leadership, spirituality, and law. The committee ensures quality control, best practices, and oversight for the managing director, who leads the team on the ground. It meets on a quarterly basis and reviews and approves work plans and budgets as well as conducts onsite visits to support and supervise the teams. They also sanction and review internal and external audits, support fundraising efforts, and interact with international partners on an as-needed basis.

Mutual respect

A meaningful and sustainable collaboration should be built on mutual respect from all concerned parties. At ACCESS, we partner with faculty with whom we share values and who respect our position as much as we respect theirs. We clearly outline our roles in a mutually agreed-upon Memorandum of Understanding (MoU) that guides our interactions. Each project has a local and international team leader/principal investigator. The MoU outlines the purpose of the collaboration, including mutual exchange and training of students, research, capacity-building endeavors, and building long-lasting relationships. The responsibilities of each party are outlined in terms of scientific, legal, and financial obligations. Clear guidance is detailed pertaining to managing and resolving conflicts as well as ensuring the smooth running of the collaboration. We additionally hold regular meetings with all our collaborators to evaluate the progress and attainment of goals. Meanwhile, we regularly receive feedback from visiting and local partners to ensure that we continuously maintain our commitment to each other.

Stakeholder engagement

We have established a community advisory board (CAB) consisting of various stakeholders from Nakaseke who understand the community's needs. By requiring that new collaborations and projects be reviewed and approved by the CAB and staff members, community involvement is ensured at all times. The CAB secures accountability and fulfills our commitment to the communities we serve by actively monitoring, evaluating, and giving regular feedback. We also use this opportunity to align with the requirements of the international GH curriculum of collaborating institutions.

Participatory selection and preparation of GH scholars

A key element of our education program is pre-departure engagement, which helps orient international participants and facilitates shared interests and aligned expectations. Before students are given the opportunity to complete a rotation at ACCESS, they comprehensively review our work by reviewing our website, discussing their questions with their respective institutions, and then submitting a formal application clearly outlining their interest in working with us. We then hold several virtual meetings involving the host and local faculty in which we align our expectations with those of the prospective students or faculty. Finally, we review and participate in the selection of candidates to come to ACCESS.

In order to operate effectively and ethically, it is crucial that our collaborators from HICs actively shift the paradigm from "helping" and "giving/giving back" to one of "learning" and "sharing" (Garba et al., 2021). We have co-developed several materials that are offered to prospective candidates with many previous shared experiences and ethical dilemmas and have dedicated continuous online resources that are available to all students.

We in LMICs must emphasize that our main responsibility is finding ways to change the current circumstances. Though we should not expect solutions to come from HICs, HICs can meaningfully participate in finding solutions with us. The key is to work together as a global community in addressing global issues, with LMICs claiming our power, drawing strong boundaries, being vocal about the many meaningful contributions we have to offer, and advocating for our place at the table.

Students should be oriented to issues of power, privilege, and colonial thinking prior to arriving at ACCESS so as to be primed for important concepts that will be reinforced through our own teachings and the individual experiences of the students. We make it clear to students that they are coming to our communities not to help us but to participate in our efforts to address the needs of our communities and learn from and with us. We have expertise in our own resources, challenges, and limitations and are happy to guide discussions on how to build culturally sensitive best practices.

The thinking that powers the ACCESS model is a cultural shift that needs time to be understood and processed. Here, we offer a robust first step. Through the give-and-take of reciprocal learning, we have gained important insights into what a true GH paradigm should look like. We take pride in how we have incorporated multicultural, multifaceted ideals into our thinking, our teachings, and our shared materials. Ours is a model of healthcare delivery that prioritizes the use of indigenous resources and community know-how, together with input from outside partners, to create a culturally sensitive best-practice model. At ACCESS, our holistic approach to healthcare truly addresses the varied needs of an individual in a way that fits and reflects their environment. We believe that this represents a true GH model and is one that can be emulated by HICs and LMICs alike.

Conceptual and methodological constraints

Most organizations in LMICs are likely to face certain general challenges. First, the reality is that hosting and properly engaging

visitors, including providing meaningful orientation, can exhaust a talented health workforce beyond its limits. Second, promoting human values, respect, and dignity while participating in bedside teaching for trainees can be difficult to navigate. Extra resources, such as translators, are required to support GH elective students in their interactions with patients and communities. Third, it can be challenging to identify and train a core group of faculty that is familiar with the GH curriculum to optimally supervise medical students from HICs. These faculty members should ideally support students in gaining a sociocultural, political, and historical understanding of their host institution and country. Finally, acquiring infrastructure and resources for GH elective students is also challenging. We have clinical material, but capacity building of faculty in GH research and education as well as the creation and institutionalization of a mentorship model for faculty and students are needed.

Specific challenges we have faced at ACCESS include disagreements with donors on the management of the program, for instance, when a donor wanted to replace a key manager in our program with occasional visitors who were poorly prepared to live in a rural setting. We have learned from these experiences to strengthen our program.

We have also encountered visitors who arrive with incorrect, unclear, or ambiguous expectations that are not aligned with our program. A few have come with a sense of entitlement and/or arrogance, which can manifest as non-adherence to local authorities, regulations, and customs. Many students arrive with expectations of practicing evidence-based medicine rooted in evidence created in another country without considering the local context. This often happens in the first weeks of the rotation but is ameliorated as students and faculty become more aware of the realities of LMICs and adjust their expectations and thought processes accordingly.

We have also faced several ethical dilemmas, particularly related to end-of-life issues. For such occurrences, we have trained our faculty to play a supportive role as students navigate these challenging times, which are quite different from what they see in their home countries.

The cost of medical services and the allocation of resources are another issue that is often challenging. Whereas, most healthcare services in government hospitals in Uganda are purportedly free, limited availability creates hidden costs for patients. This often creates inequality between the haves and have-nots, even when attending the same hospital. When investigations and drugs are prescribed for patients by the healthcare team, those who can afford them (often from outside the hospital) improve, while those who cannot afford them remain in the wards for longer periods and, at times, die. Thus, in managing patients, the clinician must always be on the lookout to ensure that whatever s/he prescribes to the patient is available or within reach of the patient's financial means. This skill, which is acquired over a period of many years, often proves to be of great distress to international students and faculty. We have tried to address this issue by ensuring that a local faculty member supports the visiting team in such instances, including the exploration of alternatives to care.

Other challenges relate to LMIC colleagues visiting HIC centers and are not the major discussion of this manuscript.

Conclusion

ACCESS Uganda has established a grassroots GH model that has successfully leveraged HIC partners to collaboratively address key challenges that have been prioritized by the people of Nakaseke. Through principles of mutual respect, community engagement, and proper governance, ACCESS has been able to work with international and local partners to ensure an enriching GH experience that addresses the needs of rural communities within Uganda. ACCESS has empowered its community as well as the growth of individuals around the world.

We believe that a pivotal component of our success is rooted in long-term friendship and trust-building among a group of people who believe in the main core values of GH. Gradually, these individuals grew into leadership roles in which they had decision-making power and came together toward this important vision of bringing justice to marginalized communities as part of restructuring GH education.

Data availability statement

The original contributions presented in the study are included in the article/Supplementary material, further inquiries can be directed to the corresponding author.

Ethics statement

Ethical approval was not required for the study involving human participants in accordance with the local legislation and institutional requirements. Written informed consent to participate in this study was not required from the participants in accordance with the national legislation and the institutional requirements.

Author contributions

RK and MiS made the first draft. BO, RM, IW, EK, JS, JL, and MaS extensively reviewed and made substantial contributions to the manuscript. All authors approved the publication of the manuscript.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Supplementary material

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/feduc.2023.1214743/full#supplementary-material

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Simulating infection prevention and control through virtual reality: a vehicle for equity, diversity, and inclusivity in Africa

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Endemics in Africa are prominent, especially in countries with low income and inadequate infection prevention and control (IPC) measures. Additionally, poorly trained nurses negatively influence infection-related indicators, and these nurses may require re-training. Re-training is expensive, and due to limited resources, healthcare institutions in Africa may not have the opportunity for their nurses to be re-trained in a critical competence such as IPC. Simulation-based education, including virtual reality (VR), has shown numerous benefits in acquiring critical thinking, communication, and clinical skills. However, VR has been reserved for healthcare education in the global north. Also, no educational programmes currently exist that harness the power of VR in a low-resource context such as Africa. We argue that VR is a possible low-cost simulation modality that can create standardised training resulting in equitable, diverse, and inclusive IPC education for nursing students. However due to a lack of technological training and ongoing support, low to middle-income countries often end up failing to implement the interventions over a longer term than the initial investment. Authors like Hofstede identified dimensions causing problems between various cultures, which might restrict the implementation of newer technologies in a diverse, equitable, and inclusive manner. The design and implementation of an educational innovation must address and integrate the cultural dimensions of the targeted context. Embracing, understanding, and respecting the variations in local culture within African universities is essential to inclusive and diverse education practices and the subsequent designing and implementation of educational innovation such as VR.

KEYWORDS

virtual reality simulaiton, infection prevention and contol, EDI, equity, diversity, inclusivity

1. Introduction

The burden of Africa's endemic diseases is the largest in the world, with infectious diseases contributing the most. Yearly, infectious diseases account for more than 227 million years of life lost with an annual loss in productivity of more than 800 billion United States Dollars (World Health Organization, 2019). Outbreak prone diseases are becoming increasingly devastating and of the ten million deaths that occur per year, the majority are in Africa (World Health Organization, 2019; Kumar et al., 2020). The healthcare system including the health workforce

is often unprepared and under-resourced to positively influence infection prevention and control.

The health workforce must be competent in infection prevention and control. However, practice suggests that healthcare workers must be constantly trained and re-trained regarding infection prevention and control (Qureshi et al., 2022). Training and re-training of the health workforce requires resources including trainers, time out of work and financial investments which are often not available in many African settings. Evidently, during the COVID-19 pandemic, health ministries in collaboration with educational institutions and partner organisations conducted country wide training and re-training of the health workforce regarding infection prevention and control. The trainings were reported as once-off institution-based occasions with limited chances for practice and competence development (Tsiouris et al., 2022). In addition, the training programmes varied across institutions and there is a scant literature reflecting on the impact of such training on the health workforce in Africa.

Nurses are the largest healthcare worker group comprising up to 66% of the health workforce [World Health Organization (WHO), 2021] and nursing education institutions are a pipeline for future competent nurses that positively influence the infection indicators in Africa. Healthcare simulation and clinical skills teaching are often presented through institution-based laboratories which are not uniformly resourced across nursing education institutions. The unequal distribution of resources for skills training, logistical issues related to institution-based training, limited human resources for training and the penetration of the digital platforms and connectivity within the continent call for alternative and inclusive educational approaches for learning and teaching infection prevention and control in Africa. In this paper, we propose an innovative and inclusive simulation modality for learning and teaching infection prevention and control focusing on nursing students in Africa.

2. Africa and nursing education

Infectious diseases are a threat to Africa's developmental goals. In the aspirational vision 2063, the African Union argues for a well-educated citizenry underpinned by science, technology, and innovation for healthy and well-nourished people (African Union, 2021). The development of health has a significant impact on the social security and economic activities of countries across the African region. A myriad of interventions focused on tackling infectious diseases have been implemented in the continent and the education of nursing students to competently engage infectious diseases is an example of such intervention (Nyaruaba et al., 2022). However, educational interventions often land in dissimilar contexts in Africa.

The context of education and professional practice have profound effects on the quality of educational outcomes. Africa, a continent of 54 countries, is an example of a plural socio-cultural and educational context interwoven with historical legacies of colonialism, inequality, and barriers to access social services (Shackleton and Gwedla, 2021). Additionally, resources and investments focused on nursing education and practice are inadequate. Ideally, countries must have sufficient nursing education institutions that positively influence the healthcare labour workforce towards universal health coverage (Cometto et al., 2020). However, Africa is imbued with a sub-optimal distribution of nursing education institutions and poor quality and quantity of nurse educators with a direct impact on the quality and quantity of the human resources for health. For example, Malawi and Zambia are reportedly operating with less than half of their targeted numbers of nurse educators, with most of them not having a qualification in nursing education (Middleton et al., 2014). Education is a basic human right, while higher education, within the context of nursing, is a privilege to individuals based on multiple factors including availability and capacity of nursing education institutions.

3. Simulation-based: equity, diversity, and inclusivity

Simulation-based education is an educational strategy that replaces or amplifies real experiences with guided practices (Gaba, 2004). Ideally, simulation is meant to replicate aspects of the real world in a manner that allows students to be immersed in their learning environment. Technology does not necessarily define simulation, but the focus should be on educational approaches grounded in established learning theories (Jeffries et al., 2015). Advancements in student clinical knowledge, skills acquisition, communication, and critical thinking have been reported as the benefits of simulation-based education in healthcare sciences. These positive outcomes related to simulation-based education are reported predominantly in the global north, as Hallinger and Wang (2020) detail the low utilisation and uptake of simulation-based education in low-and middle-income countries.

Computerised mannikins are a key feature in some simulation laboratories for nursing education, with the latest research in this field focusing on the educational influence of these mannikins in learning clinical skills and reasoning (Handeland et al., 2021). Clinical skills training and healthcare simulation are conducted in these laboratories that are often based in nursing education institutions and/or affiliated hospitals. In Africa, a handful of nursing education institutions have established clinical skills or simulation laboratories with different forms and types of simulators ranging from task trainers for the teaching of basic nursing skills to computerised mannikins that respond physiologically to nursing interventions (Burch, 2014). The Nursing Education Partnership Initiative (NEPI) supported nursing education institutions in developing and acquiring simulation laboratories with computerised mannikins in five African countries (Middleton et al., 2014). However, the overall educational effect of simulation-based education in Africa has not been realised.

Most African states do not have set standards for simulation and/or clinical skills laboratories, especially in undergraduate nursing education in as much as they are regulated by professional bodies (Moabi and Mtshali, 2022). The lack of standards for simulation and/or clinical skills laboratories contributes to a variation in available resources in these laboratories (Moabi and Mtshali, 2022) which may be linked to inconsistent learning opportunities for undergraduate nursing students within the same institution, across institutions in a country and across countries in a region. Inconsistent learning opportunities generally affect the attainment of learning outcomes, which may result in poor clinical skills. The poor training in clinical skills compromises the competence of nursing students and eventually the graduates from such nursing programmes. Poorly trained nurses negatively influence infection related indicators, and these nurses may require re-training. Re-training in practice is expensive, and due to limited resources, healthcare institutions in Africa may not have the opportunity, money, or capacity for their nurses to be re-trained in a critical competence such as infection prevention and control.

Even though simulation-based education, is reported to have supported multiple institutions in providing consistent and standardised training opportunities (Swart et al., 2019), inequality, lack of diversity and exclusivity are possible unintended outcomes in nursing education. Structural inequality is overt within the African region in relation to health workforce training due to various political, economic, and cultural reasons. Inequality unfolds in various layers, including systemic, political, and structural forms (Sorensen, 1996; Assari, 2019; Amadeo, 2022). The variation in healthcare simulation-related resources are nested within structural inequality are evident across an education institution, country and the African region, advantaging students in specific contexts over others (Maloney and Haines, 2016; Tjoflåt et al., 2021). At a localised scale, differences between campuses of the same university enshrine structural inequality (Kaufman, 2016). Institutions in the same country, as seen in South Africa, have different resources related to simulation-based education for healthcare students. Some universities have state-of-the art simulation facilities that include computerised mannikins that are accessed by most students on campus while other universities within the same country do not have any established laboratories for learning (Thurling, 2016). Furthermore, the capabilities of skillfully designing and integrating simulation activities in education vary across settings even when related to a priority healthcare issue such as infection prevention and control.

External diversity, specifically circumstantial diversity is compromised in situations where external circumstances and resources are dissimilar across and within contexts. However, external variables associated with circumstantial diversity, such as physical resources, can be modified through innovation or additional funding (Cooks-Campbell, 2022). Modifying external variables through innovations provides an opportunity to enhance diversity, inequality, and inclusivity. Nursing education must be inclusive and provide nursing students with fair opportunities to practice or learn, especially for a universal nursing competence such as infection prevention and control.

4. Virtual reality simulation a pathway to standardised training

Virtual reality is a possible simulation modality that can create standardised training resulting in equitable, diverse, and inclusive infection prevention and control education for nursing students. As an immersive application, virtual reality enables users, such as nursing students, to feel present in a digitally generated healthcare environment (Lotte et al., 2013; Fabroyir and Teng, 2018). Aligned with the principles of simulation-based education, virtual reality can be designed to support students in developing critical thinking and clinical reasoning skills related to infection prevention and control which are essential attributes for competent nurses. Presented as a mobile or desktop application, students engage in standardised training, asynchronously re-engage, practice clinical competence and receive real time feedback on their practice (O'Connor et al., 2021). A virtual reality simulation modality can be a vehicle to address standardisation in nursing education further addressing structural inequality among students, institutions and the region towards an infection controlled Africa (Barrera-Cancedda et al., 2019).

A multi-country initiative in Africa is aimed at developing and implementing a virtual reality simulation for infection control in undergraduate nursing students that is based on a desktop and/or cell phone. Ideally, the students will receive a link to the virtual reality site where an initial download will be done to save the virtual reality application on their desktop or cell phone. Due to economic limitations in African settings, the virtual reality simulations will be engaged on through low-cost data modes or most cases, without the need for data. Students will be able to engage with the self-paced virtual reality simulation receiving instant feedback on their practice at various locations, including their homes. The virtual reality simulation will standardise infection prevention and control education as all students will be exposed to universal infection prevention and control principles. Virtual reality simulation has been reported in some nursing education institutions in Africa and is showing potentially positive outcomes. The development of the virtual reality intervention needs to be informed by the context.

5. Discussion

Africa is not one homogenous cultural region. Conversely, the level of diversity is not that perplexing. The design and implementation of an educational innovation must address and integrate the cultural dimensions of the targeted context. Meeting cultural dimensions of any context enables the educational innovation to be inclusive resulting in a high propensity of assimilation into mainstream education (Pell et al., 2011; Coast et al., 2016). Africa is a den of donor driven and donor funded educational initiatives which are often designed based on the originator country's socio-cultural dynamics. Superficial amendments, such as changing the skin tone of simulators, do not necessarily address fundamental issues of access, equity and inclusivity, resulting in some initiatives turning to "white elephants".

In his seminal work on cultural dimensions, Hofstede and Minkov (2010) presents five cultural dimensions that have an influence on the adoption of innovations. These dimensions are (i) power distance index, (ii) individualism, (iii) masculinity, (iv) uncertainty avoidance index, and (v) long-term orientation. Through a Values Survey Module, some African countries were generally regarded as "masculine", with a high-power distance index, borderline uncertainty index score and reflective of collectivism (Hofstede and Minkov, 2010). Masculinity in this context refers to a cultural context that values assertiveness and competition, while countries with high power index suggest that a level of inequality within the society is endorsed by the followers as much as the leaders manifesting in social hierarchical systems. A borderline uncertainty index reflects a moderate tolerance to change and ambiguity, while collectivism is aligned with cohesiveness and being group oriented-embedded in the concept of "ubuntu" which enshrines "collective relatedness, interdependence, communality, group solidarity, and conformity" (Kpanake, 2018). In as much as the Values Survey Module, has undergone several analyses related to validity, internal consistency and representativeness of outcomes, such findings are a foundation of interacting and engaging countries in Africa especially focused on introducing innovation such as virtual reality simulation to enhance equity, diversity, and inclusion.

The process of the development of virtual reality simulation to address infection prevention and control in undergraduate nurses integrated known cultural dimensions of the included countries in Africa. The initial configuration of the need for an inclusive educational innovation was discussed with various stakeholders, considering the available resources for development, experience, and expertise. One

university in South Africa has been at the forefront of virtual reality simulation in undergraduate nursing education – and based on that experience, has developed the necessary expertise (Botha et al., 2021). Authorities and leaders in various universities in Africa were contacted individually for discussion on the possibility of including these universities in the design and development process. Due to the social value placed of face-to-face and physical interactions, the authors travelled to universities for formal and informal meetings. Snyman and Rogers (2020) underscores that partnerships are concretised through personal and informal physical meetings. The focus of the meetings is on establishing partnerships, explaining, and showcasing virtual reality as a strategy for infection prevention and control and collaboration. Aligning with the socio-cultural norms and hierarchies of host institution, the leadership at the site hosts the meetings and directs the formal and social programme. Nurse educators present their programmes and discuss their approaches to the teaching and assessment of infection prevention and control. This information is the basis of the design of the virtual reality simulation. Finally, the nurse educators are incorporated into the design of the virtual reality intervention, acknowledging and bringing in their own experience and expertise as educators in their country.

The principles of infection prevention and control are universal and permeate frontiers, but structural and contextual differences influence how these principles are taught and learnt. Consideration must be made towards investigating the socio-cultural dimension of any context before engaging in any discussion around innovation, and the concepts as presented by Hofstede and Minkov (2010) may be useful foundational information. Hierarchy, power differentials and local culture must be prioritised when communicating, planning, and designing educational innovation for enhanced sustainability and inclusion. As Africa continues to battle with infection-related diseases mirrored against dwindling resources, we postulate that virtual reality simulation may be influential in undergraduate nursing education. Nurses who graduate with competence in infection preventionand control have a positive influence on their patients, the hospitals and society in general.

6. Conclusion

Therefore, offsetting inequality, lack of diversity and exclusion (Hofstede and Minkov, 2010) that can be brought about by some simulation modalities is possible with the development of custom-made virtual reality modalities. The simulation will provide standardisation in terms of training related to infection prevention and control across various countries in their undergraduate nursing education programmes. Embracing, understanding, and respecting the variations in local culture within the African university is an essential ingredient towards inclusive and diverse education practices. Through genuine partnership development, honesty, and respect there will be not only the development of an artifact, but its subsequent implementation resulting in nurse graduates that are competent in infection prevention and control and impacting on African indicators.

Data availability statement

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding authors.

Author contributions

All authors listed have made a substantial, direct, and intellectual contribution to the work and approved it for publication.

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The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Identifying the need to institutionalize digital equity among faculty: the experience of the Kenya Medical Training College

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Background: The use of digital tools and applications in health professions education is increasing exponentially, however this has the potential to increase the digital inequities with the resulting effect of vulnerable groups facing an increased risk of digital exclusion. It is therefore important to approach digitalization with contextual determinants of the intended and unintended impact in mind. We present a perspective paper on digital equity, informed by lessons learnt at the Kenya Medical Training College (KMTC).

Methods: Using a case description methodology, we examined routine educational data collected from faculty at KMTC in November 2022. This included quantitative and qualitative data on access, ownership, utilization, confidence and skills to create, share, and exchange knowledge on the institution's learning management system. We used these factors as the conceptual framework for understanding how faculty adopt digitalization in health professions education.

Results: 306 faculty responded to the survey (response rate 27.8%) of whom 90.8 and 75.2% had personal laptops at home and at work and 75.9% had internet at work. 53.4% (n = 163) knew they had accounts created on the institution's learning management system (LMS) majority of whom had basic skills and were able to perform skills such as logging in and accessing learning resources. However, a minority had advanced skills needed for teaching and learning in the LMS.

Conclusion: Medical education institutions in LMICs need to adopt programs to enhance digital literacy and monitoring of access, utilization and self-efficacy across all learner and faculty groups, to ensure that digital technologies reduce rather than exacerbate existing inequities.

KEYWORDS

digital equity, digital divide, KMTC, digital learning, elearning, digitalization, digital skills

Introduction

Digital transformation is an important intervention in the path to universal health coverage, and it is changing the landscape of health professions education in the 21st century (Kickbusch et al., 2021). There is a growing need to embrace digital technologies, especially following the lessons learnt from the COVID-19 pandemic, as well as the growing demand for training

(Lakshmi, 2021). Many benefits to adoption in technology in health profession education have been postulated. These include the potential to transcend geographical and financial barriers, and the ability to expand opportunities for flexible training. Digital technology has therefore become a priority area for investment in institutions that offer health professional education in Lower- and Middle-income countries (LMICs), especially in elearning (Barteit et al., 2020; Gachanja et al., 2021).

The adoption of technologies by medical training institutions unfortunately has not meant that the benefits are experienced by all; in fact, it has created unintended disparities that has resulted in many faculty and students being left behind. The gains made through digitalization risk being lost or minimized if the threats presented by digital inequity are not addressed in a timely and appropriate manner (James, 2008). The threat posed by the digital divide is worse in sub–Saharan Africa where insufficient capacity in digital infrastructure, skills, connectivity, and supportive logistics such as electricity present challenges to training institutions even in urban areas.

The digital divide among faculty can be seen as simply as the gap between those who have access to ICT and those that do not. This is easy to measure especially for training institutions. However, this gap only reflects the first level of inequity (van de Werfhorst et al., 2022) and even in this level there may be nuances reflecting various sub-levels such as type of technology, duration of access, and internet speed. Multiple levels of capacity are required to attain self-efficacy. For example, personal characteristics of faculty, particularly age, gender, education, teaching experience and discipline need to be evaluated to understand their influence on adoption of digital technology (Lakshmi, 2021). Further, the context, including baseline technology penetration levels, cultural attitudes and infrastructure around digital technology mediate the outcomes around health equity and are at least as important as individual factors. It is known that digital transformation of health professions education is dependent upon the level of e-readiness, the measure of the degree to which a society "may be ready, willing or prepared to obtain benefits which arise from information and communication technologies (ICTs; Dada, 2006). E-readiness has been researched using many models, with central measurements being internet penetration, the capacity of human capital, ICT infrastructure, supportive policies and regulations. Training institutions that are not e-ready are not able to benefit from the opportunities presented by digital infrastructure. In such situations, digitalization may widen digital inequity (Heeks, 2022). It has been reported that most countries in Africa are not e-ready, and that digital interventions that do not account for limitations such as scarcity of steady power supply, lack of basic ICT skills by users, and low network coverage are likely to fail. The rapid diffusion of digital technology in African countries is creating great opportunities for marginalized groups, but it has also resulted in unequal access to new technologies, leading to what is now known as the "digital divide." Interventions to widen access to technology are important, but in addition, the movement towards digitization should include digital skills development. Access to technology is a necessary but not sufficient intervention for the digitization needs in health professions education. This can prevent widening inequalities, as well as mitigate against the effects of harmful digital marketing around health professions education such as the mushrooming of online courses of low quality. Kenya is unique in that the mobile phone penetration is very high, at 130% (Kenya National Bureau of Statistics, 2023). The Kenya Medical Training College is a state corporation under the Ministry of Health, whose mandate focuses on health professions education for different cadres. What can we learn from the experience of KMTC, in terms of identifying and addressing digital inequity? How can digital equity be institutionalized?

Abbreviations: ICT, Information, communication and technology; KMTC, Kenya Medical Training College; LMS, Learning management system; LMIC, Lower- and middle-income country; PC, Personal computer.

Methods

We analyzed routine data collected during a faculty needs assessment at KMTC in March 2023. The data was obtained through an online survey conducted by the elearning department at KMTC, whose aim was to assess learning needs and practices. The survey was conducted on Google form, whose link was shared to all faculty in the college (n = 1,100) through an email sent to the Principal of each campus with instructions to share with all academic staff. The Google form contained questions around devices, access to the Learning Management System and faculty skills on LMS. Faculty were requested to respond within 7 days. Data collected was both qualitative and quantitative. Our conceptual framework was that adoption of digitalization among faculty should proceed along the continuum of Ownership, Access, Skills, Confidence, and Self-efficacy.

Results

306 faculty responded to the survey (response rate 27.8%). The faculty represented all Departments (18) and 84% of the 74 Campuses of the institution. Of the 306 faculty, 90.8% had personal laptops, 75.2 and 75.9% had access to personal computers and internet at work, respectively, and 53.4% knew they had accounts created on the institution's learning management system (LMS). The 53.4% (163) were then asked further questions about their ability to use the LMS. Majority of the respondents had basic skills and were able to perform skills such as logging in, accessing learning resources, a large number however, were not able to update their profile (Figure 1). The advanced skills, associated with teaching and learning on the LMS, had the majority of faculty expressing "No" or "Slight" levels of confidence in the performance of the skills. These skills included uploading content (64%), enrolling and un-enrolling learners (76%), tracking progress of learners (70%) and generating reports from the LMS (78%). Quantitative data indicated that the challenges faculty faced were mostly on Infrastructure (54.9%), Skills (32%), and Training (9.2%). Some of the stated infrastructure challenges included power (frequent blackouts, access points, e.g., few sockets or extension cables), lack of or old computers and poor internet connectivity. Skills challenges included lack of confidence and minimal ICT competency. They felt there is a need for retraining and offer face-to face training vis-a-vis online. One faculty member's comment "Am not well versed on how to use online

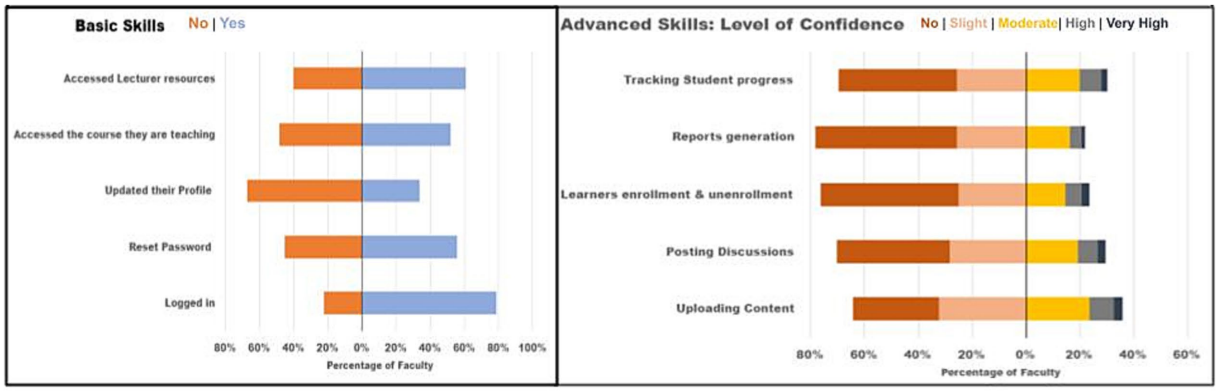

FIGURE 1
Faculty Skills for teaching and learning on the Learning Management system (n = 163) Only the 53.4% (163) who had accounts on the LMS responded to question on skills. The responses to the basic skill questions were Yes or No (left) and included those skills associated with access to and within LMS. The advanced skills were those directly associated to teaching and learning (right). A Likert scale was used to measure the individual faculty's level of confidence to perform select advanced skills.

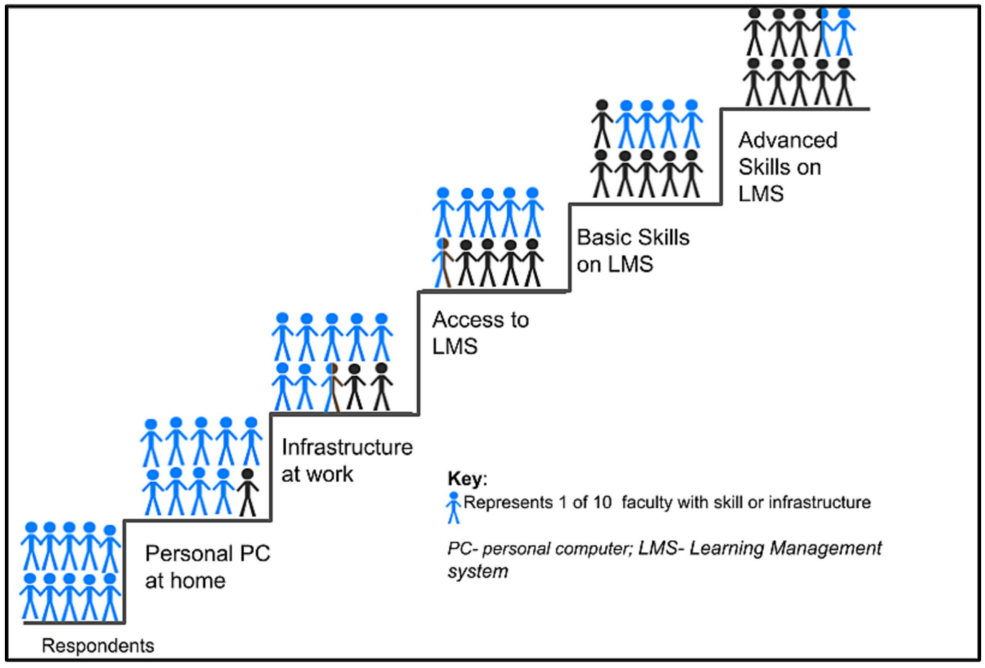

FIGURE 2
Digital divide among faculty.

platforms in teaching hence very reluctant to adopt what I am not sure about" gives a clear insight on their personal assessment.

Figure 2 depicts the digital inequity among faculty (n = 306). The inequity can be seen as the "loss" of faculty along the pathway to self-efficacy. The first level of inequity is in infrastructure with 90% having personal computers (PCs) at home, 75% having no access to PCs or internet at work. The next level of inequity is on access to the institution's LMS with 55% answering "Yes" to whether they had accounts.

The following two levels of inequity are on digital literacy. 45% having basic skills on the LMS and only 15% having moderate to very high confidence on skills needed for teaching and learning (advanced skills).

Discussion

This was a broad analysis that evaluated various aspects of adoption of technologies such as access, ownership, utilization, skills and self-efficacy. It provides evidence for the extent to which the needs at these levels have been addressed. The response rate of 27.8%, albeit low, is comparable to what has been reported in the literature on online surveys (Shiyab et al., 2023) but may perhaps be a reflection of the challenges on the use of technology.

Institutions of higher education are adopting digital technologies for teaching and learning. This has been necessitated by the potential gains and the emerging trends in use of digital technology in medical

education. However digital inequities are present among faculty and can be seen in the various levels in the continuum of digitalization (Figure 2). In each level there are faculty who have been "left behind."

The first level is personal ownership of laptops where 10% are left behind and do not own devices. This is interesting since the country has a very high (130%) mobile phone coverage, meaning that many Kenyans have more than one mobile phone device (Kenya National Bureau of Statistics, 2023). It is likely that the low ownership of laptops is related to their high cost, as compared to the cost of mobile phone devices. But importantly, it may point to the fact that the 130% overall coverage masks an unexplored digital divide. The divide increases progressively such that at the level of the skills needed for teaching and learning using the available technology, 85% of faculty are left behind. To our knowledge, we are the first group to demonstrate the progressive widening of this divide along the continuum.

It is important that training institutions identify and understand the divide among faculty (Soomro et al., 2020; Goh and Blake, 2021; Lakshmi, 2021) and actively work towards reducing the gap. One way to do this is to develop a checklist or questionnaire that identifies gaps at specific levels of the continuum of digitalization, such as the online tool used in this study. The second way is to collect and disaggregate data by key variables such sociodemographic factors, which are known to affect equity. PROGRESS plus factors (Place of residence, Race/ethnicity/culture/language, Occupation, Gender/sex, Religion, Education, Socioeconomic status, social capital) are often used to apply an equity lens to health interventions (Cochrane, 2023). It is expected that the same variables are relevant predictors for digital equity in medical education.

While the shift to digital learning modalities offers benefits in health professions education, it is dependent upon acquisition and maintenance of a certain standard of infrastructure, digital literacy and skills. These are the main determinants of digital equity. Heeks (2022) has described access, adoption and use of technology as key areas where inequity may be noticed. In this case study, we have shown that the access to infrastructure may be nuanced by location (at home and at work), given that faculty may facilitate online teaching and learning from remote locations. It is interesting that a higher proportion of faculty had access to infrastructure at home rather than at work. This points to the need for the institution to continue to invest in additional infrastructure, in addition to all the other levels of digitalization.

The digital divide is not expected to disappear without interventions. In fact, the digital inequities are likely to grow as technology increases, if there are no simultaneous interventions to address the divide. To ensure no faculty are left behind, inclusion should be complete not partial (Heeks, 2022). For example, faculty have different needs, competencies and attitudes which should be considered as interventions are developed. Secondly the value of digital equity must be acknowledged by all stakeholders, including faculty. Thirdly, individual and institutional context must be considered, such that innovative interventions are developed. Context may include institutional infrastructure, norms, sustainability, peer impact, geographical location of the campus, policies, standards, regulation and quality assurance. The multiple factors that should be considered shows that institutionalization of digital equity is likely to be a complex and multifaceted endeavor.

A key limitation of the study is that the socio-demographic data including gender, age and education level was not collected. There is a possibility that there are other levels of inequities that may have been masked. This evaluation was limited to the unique case of KMTC, however comparability with other institutions is feasible because the conceptual framework is applicable to diverse institutions. The use of an online survey may introduce bias in that only those with digital skills may take part, which adds to the richness of the reflections on the digital divide. An important strength of the paper is that we have examined how routine data can be used to identify digital inequity, which is lacking in the literature. Another strength is that the study fills an important gap, where there is paucity of evidence from low- and middle-income countries, which would benefit from digital education, and we provide evidence that is context specific.

Conclusion

Documenting the findings in this case report contributes to the knowledge base on understanding digital equity in health professions education. It contributes to the global debate on the digital divide in health and education, and may inform future implementation priorities at the KMTC. This includes programs to enhance digital literacy and monitoring of access, utilization and self-efficacy across all learner and faculty groups, to ensure that digital technologies reduce rather than exacerbate existing inequities and inequalities. Similar institutions should adopt policies that avert adverse effects of digital inequities, and analyze similar routine data to guide decisions and action on institutionalizing digital equity. Institutions in LMIC should explore enabling private-public and north–south partnerships that could provide infrastructure and digital skills solutions. Future research might explore the digital divide among other users such as learners, and the impact of various interventions towards institutionalization of digital equity.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors upon reasonable request, and within the existing data protection laws.

Author contributions

WG: conception and analyzing data. NM and WG: interpretation of data, writing, revising, and approval of the manuscript. All authors contributed to the article and approved the submitted version.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Theories, models, and best practices for decolonizing global health through experiential learning

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The decolonization of global health is increasingly promoted as an essential process for promoting social justice, achieving health equity, and addressing structural violence as a determinant of health. Innovative curricular design for short-term, field-based experiential education activities in global settings represents an important opportunity for bringing about the types of change promoted by the movement to decolonize global health. To identify theories, frameworks, models, and assessment tools for short-term study abroad programs, we conducted a federated search using EBSCOhost on select databases (i.e., Academic Search Ultimate, Medline, CINAHL, and ERIC). A total of 13 articles were identified as relevant to curricular innovations, theories, and designs involving experiential education and learning in global settings that are consistent with the aims of decolonizing global health. The subsequent manuscript review revealed several common themes that inform planning, execution, and evaluation of global experiential education programs. Global education experiences can contribute to decolonization by seeking the interests of host communities. Recommended actions include treating local partners as equals in planning and design, providing compensation to hosts for resources and services rendered, creating opportunities for local practitioners to collaborate, interact, and share knowledge with students, and ensuring the rights of local participants are protected. Additionally, the aims of decolonization are furthered as student participants become aware of and are inspired to dismantle colonial practices. Transformational experiential learning includes engaging students with diverse communities and local knowledge, maximizing participation with local populations and community partners, and engaging in critical thinking and self-reflection culminating in intercultural competence.

KEYWORDS

decolonization, global health, education, pedagogy, best practice

1. Introduction

The prevalence of scholarly articles dealing with the 'decolonization of global health' has grown exponentially over the past two decades (Faerron Guzmán and Rowthorn, 2022). Calls are increasingly being made to decolonize every aspect of global health from partnerships and collaborations (Bhandal, 2018) to research (Lawrence and Hirsch, 2020; Abouzeid et al., 2022) to authority structures (Demir, 2022) to philanthropic efforts (Schwab, 2021) to

medical education and missions (Garba et al., 2021; Tracey et al., 2022) to health education and promotion (Eichbaum et al., 2021) to nutrition (Calderón Farfán et al., 2021; Van Winkle, 2022) to mental health (Wessells, 2015) and beyond (Faerron Guzmán and Rowthorn, 2022). While the push for decolonizing global health is clearly based on urgent needs for a transformation in how global health is understood and pursued, there is also a need for clarity, consensus, and purpose in moving forward with decolonization in ways that are truly meaningful, impactful, sustainable, and that avoid unintended negative consequences (Abimbola and Pai, 2020; Hellowell and Schwerdtle, 2022).

The specific goal of this article is to explore efforts to design short term experiential learning programs (e.g., faculty led study abroad programs) in ways that mesh with a coherent framework, are based on sound theory, and align well with the aims of decolonizing global health (Prasad et al., 2022; Ratner et al., 2022). In doing so, we will consider input from relevant articles dealing with theory, methods, models, frameworks, and assessments related to best practices in short-term experiential education abroad, while at the same time aligning identified best practices with the aims for decolonizing public health.

1.1. Definition and aims of decolonizing global health

The Decolonizing Global Health Working Group (2021) at the University of Washington's International Clinical Research Center has developed a Decolonizing Global Health Toolkit that begins with this definition of Decolonizing Global Health: reversing the legacy of colonialism in health equity work. The Working Group further proposes four primary aims for decolonizing global health practices meant to guide global health practitioners in a variety of fields, including global health education and promotion. As such, they have relevance for this paper and include: (1) achieve equitable collaborations, (2) center projects around local priorities, (3) diversify leadership, and (4) promote respectful, collaborative interactions and language/tone in all communications (Decolonizing Global Health Working Group, 2021).

1.2. Barriers to decolonizing global health

While pursuing these aims, it is helpful to consider barriers to decolonization that must be managed. For example, Kulesa and Brantuo (2021) identify several barriers to decolonizing global health educational partnerships including: the challenges of bringing all relevant stakeholders to the table; managing anxieties among indigenous or vulnerable peoples related to a growing sense of inequity and loss of belonging; and balancing a variety of ethical dilemmas in global health work (Kulesa and Brantuo, 2021). Resolution of these barriers requires targeted strategies, deep community immersion, and in-depth, open discussions with local partners about appropriate moral frameworks that can guide understandings and mutually acceptable resolutions to moral dilemmas.

1.3. Avoiding unintended consequences

As with all public health endeavors, taking a systems thinking approach that fully engages relevant stakeholders is an important process for designing programs and interventions that can minimize the risk of unintended consequences (De Savigny and Adam, 2009). For example, Hellowell and Schwerdtle (2022) have cautioned against three specific harms that should be avoided as the decolonization agenda moves forward, including the potential for: undermining confidence in scientific knowledge; accentuating inter-group and international antagonisms; and curtailing the opportunities for redistributive change in the future (Hellowell and Schwerdtle, 2022). Some authors even argue that if the most radical changes promoted by decolonization are realized, global health as we know and understand it may cease to exist, leaving us with the need to come up with a new name for the discipline (Abimbola and Pai, 2020).

1.4. Philosophical orientation

Philosophically, this paper is in alignment with the Freirean school of thought that education can be an empowering force for positive change, especially for the oppressed and most vulnerable. As it applies to the decolonization of global health, education can be instrumental in allowing individuals and communities to move beyond colonial legacies while gaining local control over the social determinants of health (Giroux, 2010; Freire, 2018). Adopting best practices for study abroad programs is an essential part of this process.

This paper, including our findings outlined below, are presented with the intent of avoiding the negative consequences outlined by Hellowell and Schwerdtle (2022), while at the same time identifying best practices for short-term experiential learning in global settings that are theory and evidence-based, and that align most closely with the highest aims of the decolonization movement (Eichbaum et al., 2021).

2. Methods

Research activities for this synthesis was conducted during November 2022 – April 2023. To identify relevant scholarly articles dealing with educational approaches to the decolonization of global health researchers conducted a systematic review of the literature. This review did not involve human participants, was limited to scholarly published articles written in English from January 2010 to December 2022, did not incorporate grey literature, and had to include full text.

2.1. Search strategy and eligibility criteria

A federated search was conducted using EBSCOhost on select databases (i.e., Academic Search Ultimate, Medline, CINAHL, and ERIC). Using key search terms: 'global health' and 'decolon* and ('pedagog* or study abroad or learn* or educat* or experien*') [where the asterisk catches variations of suffixes], 190 articles were identified. Our initial search shows that a majority of results came from Medline ($n = 84$) followed by Academic Search Ultimate ($n = 80$), CINAHL Complete ($n = 20$), and ERIC ($n = 6$). Once duplicates were removed,

the remaining 131 articles were screened by all three authors for relevance to the goals of this article.

Using inclusion criteria: articles dealing with theory, models, frameworks, assessments, and best practices for conducing short-term experiential education abroad within the context of decolonizing global health, 25 articles underwent full text assessment. At the same time, 106 articles were excluded for lack of relevancy. Exclusion criteria included: subject was insufficiently relevant to global health promotion and experiential learning, research was insufficiently related to the inclusion goals outlined above, and articles were off-topic (e.g., decolonizing bacterial infections) (see Figure 1).

After careful full text review and collective analysis, a total of 13 articles were identified as relevant to curricular innovations, theories, and designs involving experiential education and learning in global settings that are consistent with the aims of decolonizing global health. The subsequent manuscript review revealed several common themes that inform planning, execution, and evaluation of global experiential education programs.

3. Results

After a review of the full text of remaining articles, thirteen were selected as being especially relevant to the goal of identifying theories, frameworks, models, best practices, and assessments for the design of short-term, field-based experiential education programs.

Three articles dealt specifically with short-term global health educational experiences (Myers and Fredrick, 2017; Wood and Jobe, 2020; Hawks, 2021), while others focused on contextual factors needed to support the development of global health study abroad experiences, such as curriculum and general global health education (Pentecost et al., 2018; Naidu, 2021; Wong et al., 2021; Ratner et al., 2022), faculty development (Behari-Leak et al., 2021; Hawks, 2021; Naidu, 2021), research practices (Keikelame and Swartz, 2019; Lawrence and Hirsch, 2020), and partner relationships (Kulesa and Brantuo, 2021; Prasad et al., 2022).

Ten articles targeted one or more specific intervention or strategy. Myers and Fredrick (2017), Wood and Jobe (2020), Hawks (2021), and Ratner et al. (2022) all applied high impact educational learning experiences to promote decolonization principles in students. Pentecost et al. (2018), Behari-Leak et al. (2021), Hawks (2021), Naidu (2021), and Prasad et al. (2022) similarly promote specific curriculum and design interventions. Lawrence and Hirsch (2020), Kulesa and Brantuo (2021), Prasad et al. (2022) further outline recommendations regarding partnerships between global health programs and host communities.

Multiple themes and patterns emerged from these targeted curricular, experiential, and program development strategies and interventions that can help guide study abroad best practices within a decolonization framework.

3.1. Themes in best practices affecting students

Transformative Learning Theory (TLT) is a common thread in all articles that proposed student focused interventions. Some authors

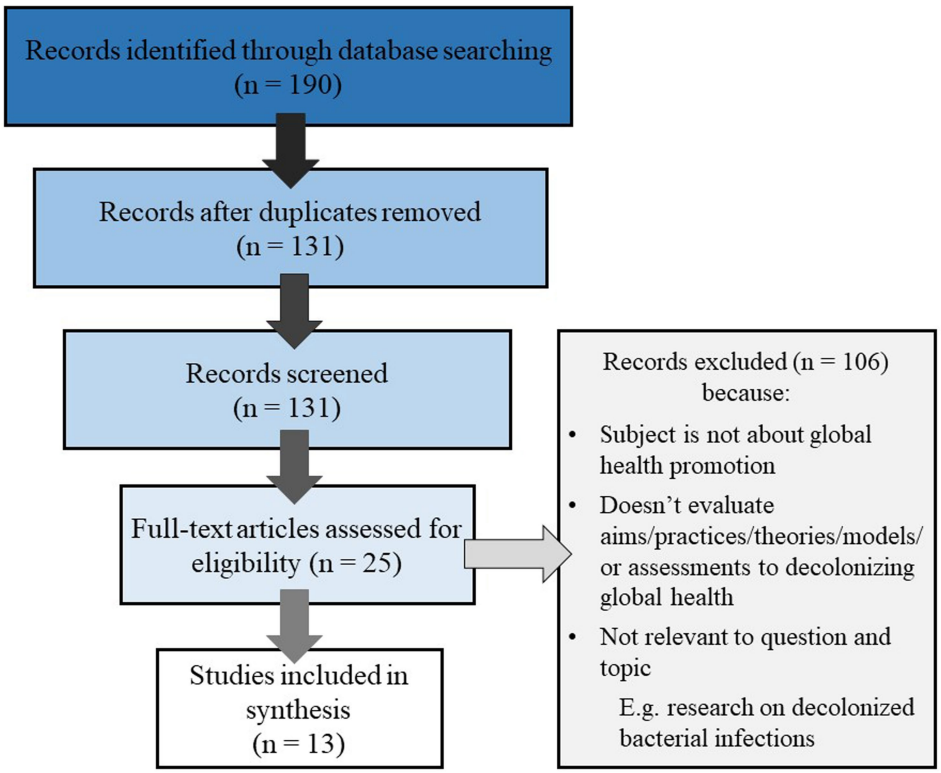

FIGURE 1
PRISMA diagram of systematic review.

directly referred to TLT (Wood and Jobe, 2020; Hawks, 2021), while other frameworks included very similar elements (Myers and Fredrick, 2017; Ratner et al., 2022), particularly disorienting dilemmas, critical reflection, and integration and action based on new perspectives. These steps each help students progress along the path from being unaware of colonial legacies to becoming agents of decolonization. Of note, these same concepts are deeply interwoven in the praxis of Freire and provide an underlying moral foundation for this theoretical and philosophical approach to education (Darder, 2017).

3.2. Disorienting dilemmas

Ratner et al. (2022) recognizes that true decolonial education must start with an initial realization and a grappling with real life struggles caused by colonial power. Myers and Fredrick (2017), Wood and Jobe (2020), and Hawks (2021) each posit that short-term educational experiences in a global setting can be effective settings for creating these disrupting dilemmas. "Numerous authors have conveyed the unsettling experiences felt by participants encountering international settings especially for the first times" (Wood and Jobe, 2020). Hawks (2021) comments on the effectiveness of deep engagement with diverse communities, and Myers and Fredrick (2017) attribute transformative benefits of "desirable difficulties" in learning retention.

3.3. Critical reflection

According to Hawks (2021), reflection becomes a catalyst for converting experiences into new, and hopefully transformative perspectives. It can also promote critical examination of course concepts (Hawks, 2021). Taking time to reflect allows learners to identify and confront their own biases (Ratner et al., 2022). Additionally, reflection is helpful in assessing an individual's progress toward transformation (Wood and Jobe, 2020).

3.4. Integration and action

Transformative learning culminates as new perspectives inform action moving forward. This would translate into observable behavior that could only be completed after engaging in the project (Wood and Jobe, 2020). A learner who has reached this stage is actively seeking to dismantle colonial practices, ideally at a systemic level (Ratner et al., 2022).

3.5. Assessment tools

Wood and Jobe (2020) and Ratner et al. (2022) each propose tools for assessing students' progress as they engage with transformational learning activities. Ratner's tool moves learners through stages including Pre-contemplative Learner, Contemplative Reflective Learner, Critical Action Learner, and Transformative Action Learner. The first stage is a baseline, while the final stage is aspirational. Ratner notes that regardless of stage, one is never finished with transformation and an 'end-point' would be antithetical and possibly harmful to learners' decolonial journey" (Ratner et al., 2022).

Wood and Jobe (2020) propose an assessment tool that takes three different competencies—Global and Cultural Competency, Leadership, and Service Learning and Civic Engagement—through three stages—Exposure, Integration, and Transformation. Exposure indicates an openness to improving one's views, integration is using experience to advance a cause, and transformation involves using one's leadership skills to empower others to embark on the same process. Wood and Jobe (2020) point out that short term study abroad experiences may not be sufficient to move students through all three stages, however they can be an important element in this journey.

Myers and Fredrick (2017) describe a program that seeks to address the shortcomings short-term study abroad programs may have compared to longer courses of study in a global setting by engaging students in a four-year, longitudinal global medical program. This course follows the transformative learning pattern by creating a disturbing dilemma during a first-year, short-term study abroad experience, guiding reflection during years two and three, and culminating in a second trip to the same community during the fourth year that integrates learning into clinical experience.

3.6. Themes related to curriculum and program design for study abroad experiences

As program planners design study abroad experiences with an aim toward decolonization, the best practices in the literature fall into themes of (1) challenging knowledge hierarchies, (2) self-awareness and cultural humility, and (3) understanding of the larger systemic, historical, and sociopolitical global health landscape (Pentecost et al., 2018; Kulesa and Brantuo, 2021; Skopec et al., 2021). Wong points out the need to move from biomedical hegemony to epistemic plurality (Wong et al., 2021). Decolonization demands that curricular design question the "structured, standardized, compartmentalized" approach to medical and health education, as well as the assumption that this approach is superior in efficiency and measurability (Naidu, 2021). Additionally, to both meet the aims of decolonization and further the progress of innovation, an appreciation of traditional and indigenous practice and ways of knowing is necessary (Naidu, 2021).

As Ratner points out, even the most advanced and experienced practitioners and educators may be novices when it comes to decoloniality (2022), highlighting the need for critical reflection, self-awareness, and cultural humility (Wong et al., 2021). This includes awareness of the knowledge and value systems in which one is formed and embedded (Pentecost et al., 2018). Authors emphasize the distinction between cultural competence and their chosen phrases such as critical reflection (Wong et al., 2021), critical consciousness (Keikelame and Swartz, 2019), and critical awareness (Naidu, 2021). Because culture changes one cannot be simply competent, but also must possess the humility to be adaptable to changing times and contexts as one continues to learn (Keikelame and Swartz, 2019). Behari-Leak et al. (2021) encourage changing the teacher-student power structure as a tool of decolonization through vulnerability, making the teacher and students co-learners, and drawing on the principles of Transformative Learning Theory, give both parties disrupting dilemmas to spur transformation.

Finally, multiple authors argue that an understanding of the history and legacy of colonialism in global health and medicine is essential to global health education. Additionally, current social and political factors must be acknowledged, taught alongside and integrated into the global health curriculum (Eichbaum, 2017; Pentecost et al., 2018; Behari-Leak et al., 2021; Naidu, 2021; Wong et al., 2021). Pentecost et al. (2018) encourage the integration of the humanities, arts, and social sciences, to promote understanding of history, center inclusion, and seek social justice.

3.7. Themes related to partner relationships in study abroad experiences

Study abroad experiences inherently involve partnerships with host nations, communities, and organizations. The colonial model inherently produced hierarchical relationships between unequal partners. Themes in the literature regarding partnerships promoting decolonization include: (1) mutual partnerships with bidirectional learning and empowerment of host country, (2) sustainable programs and capacity building, and (3) accountability and safety.

In the interest of mutual partnerships, global health programs can build trust with partners by prioritizing community engagement, and emphasize respect, reciprocity, collaboration, and cooperation (Keikelame and Swartz, 2019). Trust is maintained by listening to the community members including traditional practitioners, leaders, lay people, and those on the receiving end of services (Lawrence and Hirsch, 2020; Prasad et al., 2022). Bidirectional learning can include giving partners opportunities to share their knowledge and perspectives (Prasad et al., 2022), as well as equalizing access to opportunities, educational experiences, and credit (Keikelame and Swartz, 2019; Eichbaum et al., 2021). Host communities can be empowered as they are allowed to define their own needs and the activities that take place among their people (Prasad et al., 2022). Recognition of community assets and indigenous strengths also leads to relationships that Keikelame and Swartz (2019) define as "power with" instead of "power over."

A concern with short-term study abroad experiences is that they lack the structure to be sustainable in the long run. Myers and Fredrick (2017) note that this is one of the challenges that is addressed by creating a longitudinal study abroad program, however they acknowledge logistical barriers to maintaining these programs. Kulesa and Brantuo (2021) advises integrating into the community, and asks international partners to consider, "If you cannot integrate, is your presence needed?" Lawrence and Hirsch (2020) encourages utilizing local institutions and expertise as well as existing infrastructure for research to avoid the trap of the "fly-in, fly-out, parachute and publish" researcher.

Lastly, authors emphasized the need for study abroad programs to be accountable for actions and protect the safety of their host communities (Eichbaum et al., 2021; Prasad et al., 2022). Research and program interventions should follow ethical principles, use understandable language, and collaborate with community leaders and practitioners (Keikelame and Swartz, 2019). Protecting the vulnerable is an important element of building trust (Keikelame and Swartz, 2019), and partners should pay attention to the experiences that have led to fear-based rumors such as those about "blood-stealing" (Lawrence and Hirsch, 2020). Participants and facilitators should recognize potential power imbalances and the dangers such imbalances may pose to partners in a position of lesser power (Kulesa and Brantuo, 2021). Additionally, participants should recognize power imbalances within culture, with an awareness that culture does not excuse or justify harm (Kulesa and Brantuo, 2021).

4. Discussion

As outlined by Salm et al. (2021), the concept of 'global health' as a coherent endeavor or discipline has been defined with great variability arising from at least four distinct categorical approaches including: (1) a 'multiplex approach to worldwide health improvement taught and researched through academic institutions;' (2) an ethos guided by principles of social justice; (3) a governance activity that arises from problem identification, political decision-making, and allocation of resources; and (4) more vaguely as a 'polysemous concept with historical antecedents and an emergent future' (Salm et al., 2021). Given the overlapping, broad range of understandings related to global health, the endeavor of decolonization takes on increased complexity. So much so that complexity theory may be a useful orientation for defining global health in a way that captures global health as the integrated outcome of a rapidly evolving globalized system that includes economic, political, cultural, and environmental forces in a webbed, dynamic, and interdependent fashion (Faerron Guzmán, 2022).

As part of this complexity, it is also important to acknowledge that there is heterogeneity within communities. Not all voices and experiences are the same. Needs and desires may diverge between different groups and individuals, and the moral and ethical frameworks at work may also be varied. Understanding these perspectives, especially those of the most vulnerable, and those most impacted by colonial legacies is an important endeavor and priority (Douedari et al., 2021; Faerron Guzmán, 2022).

Given the level of complexity, the decolonization movement cannot assume that global health is a discrete, malleable enterprise that can be manipulated independent of the larger geopolitical and global contexts within which it functions. As a case in point, Hellowell and Schwerdtle (2022) argue that the astonishingly inequitable distribution of COVID-19 vaccines globally represents not only 'an historic failure of the global health endeavor,' but more accurately, 'of the global economic order in which it is embedded.' The decolonization of global health must therefore coincide with the decolonization of global economic and political orders, or it becomes a myopic movement with limited prospects for achieving its ultimate aims (Hellowell and Schwerdtle, 2022).

Nevertheless, despite ambiguity and complexity, targeted activities within the global health arena can exemplify the overarching aims of the decolonization movement and become forces that influence increasingly larger spheres of global health practice and the larger contexts within which it functions. Global health education in general (Hawks and Judd, 2020; Krugman et al., 2022), and short-term, experiential learning activities in particular, such as study abroad programs (Ohito et al., 2021), are well positioned to actively articulate the many nuances of the global health endeavor, including the complex geopolitical, cultural, and economic contexts within which it operates, to 'boots on the ground' students from a wide variety of backgrounds pursuing a wide variety of disciplines in ways that can

deeply transform understandings and future behaviors that contribute to decolonization efforts across many dimensions (Sathe and Geisler, 2017).

Based on the articles reviewed in this paper, An Interactive Framework for Decolonizing Global Health Education (see Table 1) has been developed that builds on Transformational Learning Theory to articulate educational themes, curricula, learning activities and support systems that strategically align with the aims of (and barriers to) decolonizing global health while actively avoiding negative, unintended consequences and assessing student transformational progress along the way. As outlined in Table 1, the Interactive Framework attempts to align specific aims of decolonizing global health (Decolonizing Global Health Working Group, 2021) with barriers (Kulesa and Brantuo, 2021) and potential unintended consequences (Hellowell and Schwerdtle, 2022) associated with each aim. The Framework then identifies educational themes and strategies, based on Transformational Learning Theory, that might be employed to achieve each aim while mitigating associated barriers and unintended consequences (Lokugamage et al., 2021). While the alignment is not perfect, the Framework provides a dynamic, interactive matrix for applying theory-based pedagogical strategies that can help meet the aims of decolonizing global health while at the same time addressing key barriers and minimizing negative, unintended consequences.

The proposed Framework shares elements of the Fair Trade Learning Rubric developed by Eric Hartman and colleagues which similarly provides important ethical considerations and strategies related to service learning, global engagement, and volunteer tourism (Hartman, 2015; Hartman et al., 2018). The Framework also expands on the article Best Practices in Global Health Practicums (Withers et al., 2018), by specifically identifying decolonization as a targeted outcome of global health practicum experiences.

By conscientiously utilizing the proposed Framework for Decolonizing Global Health Education, global learning and study abroad experiences can contribute to decolonization in numerous ways. Foremost, study abroad programs must conscientiously seek the interests of host communities as determined by the communities themselves. This involves bringing all stakeholders to the table in the form of shared leadership and equitable partnerships that identify priorities, plan activities, resolve ethical dilemmas, and create sustainable, accountable relationships based on trust. Recommended actions include treating local partners as equals in planning and design, providing compensation to hosts for all resources and services rendered, creating opportunities for local practitioners to collaborate, interact, and share knowledge with students, and ensuring the rights and values of local participants are protected.

Additionally, the aims of decolonization are furthered as student participants become aware of and are inspired to dismantle colonial practices. Transformational experiential learning includes engaging students with diverse communities and local knowledge, maximizing participation with local populations and community partners, being exposed to disorienting dilemmas, and engaging in critical thinking and self-reflection that leads to increased cultural competence and action.

As part of study abroad programs, instructors and leaders should design curricula and learning experiences that foster an awareness of colonial and hierarchical historical practices and their impact on current power differences while encouraging an examination of one's own paradigms and frame of reference. Additionally, the broader influences of colonialism on geopolitical, economic, and cultural structures that constrain global health activities must be presented, discussed, and understood.

As outlined in this paper, short-term, faculty-led study abroad programs that utilize transformational learning theory to carefully address educational themes and design learning activities that align with the aims of decolonizing global health education can be an important step in the overall effort to decolonize global health. Without such efforts, study abroad programs may

TABLE 1 An Interactive Framework for Decolonizing Global Health Education.*

Aims of decolonizing global health	Educational themes and strategies	Transformational learning theory principles and strategies	Barriers to decolonization of global health	Potential unintended consequences
Achieving equitable partnerships	Partnering relationships—equitable, mutual, sustainable, accountable	Disorienting dilemmas—grappling with real life struggles caused by colonial power	Ability to bring relevant stakeholders to the table	Accentuating inter-group and international antagonisms
Centering projects around local priorities	Curricular and program design—challenging knowledge hierarchies	Critical reflection—transforming learning experiences into new perspectives	Persistence of anxieties related to inequity and loss of belonging	Undermining confidence in knowledge generated by dominant cultures
Diversifying leadership	Promoting Self-awareness and cultural humility	Integration and action—actively seeking to dismantle colonial practices	Inability to ensure inclusion of all social and cultural groups	Failing to redistribute decision-making power in global health
Promoting respectful, collaborative interactions	Understanding the systemic, historical, and sociopolitical global health landscape	Applying assessment tools for gaging transformational progress	Need to balance different sociocultural norms in navigating ethical dilemmas	Curtailing opportunities for future redistributive change

*Based on our review of the literature, aims, educational strategies, TLT principles and strategies, barriers, and unintended consequences have been loosely aligned in each row. Specific educational strategies may be good options for addressing the aims, barriers, and unintended consequences on the same row. That said, the Framework is meant to be interactive and dynamic, with opportunity for creativity in applying a variety of educational strategies to the achievement of various aims.

unwittingly contribute to colonial practices that perpetuate inequities while failing to address social injustices (Hartman et al., 2018).

5. Conclusion

Important steps are being taken globally to address many of the key aims for decolonizing global health. For example, UNESCO's Recommendation on Open Science is designed to make scientific knowledge more accessible and ensure that the production of knowledge is equitable, sustainable, and inclusive (UNESCO, 2022). The 2015 launch of the Sustainable Development Goals by the United Nations, with the overarching principle of "leaving no one behind," underscores the central theme of health equity across each of the 17 goals (Marmot and Bell, 2018). These efforts clearly align with other calls for the decolonization of global health and represent necessary strategies for promoting social justice, achieving health equity, and addressing structural violence as a determinant of health throughout the world.

While recognizing that 'global health' is a multi-dimensional endeavor that takes place within complex economic and geopolitical forces (Faerron Guzmán, 2022), we nevertheless appreciate the essential value of education as a powerful tool that can support desired outcomes. Specifically, short-term, experiential learning programs can be a meaningful force for promoting decolonization aims if they: (1) are designed within a theory-based framework that incorporates the multiple dimensions of global health; (2) explicitly explore global health endeavors within geopolitical and economic contexts, and (3) provide guided, real-world experiences that help students reflect upon and internalize the values of the decolonization movement (Hawks, 2021). These efforts are consistent with Paolo Freire's efforts to develop an enlightened educational approach that empowers oppressed populations and delivers on the aims of decolonizing global health (Darder, 2017).

Data availability statement

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

Author contributions

SH, HS, and JH contributed to conception and design of the study. SH and JH organized the database search. HS compiled results and integrated findings into the results section. JH wrote the methods section and designed the PRISMA diagram. SH wrote the first draft of the introduction, discussion, and conclusion sections. SH, HS, and JH had primary responsibility for sections of the manuscript. All authors contributed to manuscript revision, read, and approved the submitted version.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Ten-year evaluation of an immersive global health medical school course using a four-principle equity framework

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Introduction: Responding to a growing need for health care professionals equipped with global expertise in local and international settings, an innovative global health medical school course was developed that combines rigorous didactics, mentorship, cross-cultural training, and international experiences to build students' cultural humility and clinical skills.

Methods: Recognizing that global health service trips and courses can unintentionally exacerbate inequities and power imbalances, this course was evaluated using the four principles of Melby et al.'s Guidelines for Implementing Short-term Experiences in Global Health. These principles include skill building in cross-cultural effectiveness and cultural humility, bidirectional participatory relationships, local capacity building, and long-term sustainability.

Results: The course was developed with long-standing global partners and includes a capstone project that is intended to strengthen local capacity with benefits to the site and student. Student course evaluations, supervisors' observations of students, and supervisor feedback forms indicate that this course achieves these principles. Furthermore, there is evidence that students developed cultural humility, acquired foundational science knowledge and relevant skills, and changed their medical practice.

Discussion: This approach could serve as a model for institutions seeking to enhance training in global health for medical students.

KEYWORDS

global health, medical education, foundational science, international rotation, health equity

1. Introduction

Experience in global health is increasingly viewed as an essential component of medical and public health training (Drain et al., 2009; Rowson et al., 2012). There has been a growing demand by students in high-income countries (HIC) for educational opportunities that build skills for research in global contexts, clinical knowledge for service delivery in low-income settings, cross-cultural competencies, and tools to address global health inequities (Macfarlane et al., 2008; Merson and Page, 2009). The rise in global health interest across academic, business, and government sectors has driven expansion of opportunities for global health education and cultural humility training in medical schools (Drain et al., 2007). Moreover, there are increasing

demands for health care providers who can effectively engage people with international backgrounds and provide care with a high degree of cultural competence regardless of setting (Crump and Sugarman, 2010).

Responding to these needs, the Vanderbilt Institute for Global Health (VIGH) and the Vanderbilt University School of Medicine (VUSM) developed a global health integrated science course for third- and fourth-year medical students to develop competencies aimed at providing high quality and equitable health care to diverse patients in both local and global contexts. The course also seeks to build and enhance sustainable, bi-directional partnerships for health care, particularly in low-resourced settings. This immersive, foundational month-long course includes clinical experience in low- and middle-income countries (LMICs), mentoring, a capstone project and paper, and digital didactic modules and discussions that explore topics on global health epidemiology, equity, healthy policy, and health systems.

Global health service trips and courses can unintentionally exacerbate inequities and power imbalances (Eichbaum et al., 2021). To address this issue, frameworks have been developed to guide educators in mindful design of courses and short-term experiences in global health (STEGH) (Melby et al., 2016; Shah et al., 2019; Prasad et al., 2022). These principles promote STEGH elements that encourage sustainable and ethical engagement with local collaborators. This course utilizes many of the principles outlined as best practices in developing and implementing STEGHs. We expand the use of an equity framework to evaluate an existing global health program that has been in existence for ten years. As an established framework, Melby et al. has been frequently utilized to reinforce global health equity standards.

After a decade of offering this global health clinical immersion course, we sought to formally evaluate and understand how it aligns with best practice principles. We selected Melby et al.'s (2016) Guidelines for Implementing Short-term Experiences in Global Health as the framework to evaluate the course. The principles in this framework include skill building in cross-cultural effectiveness and cultural humility, bidirectional participatory relationships, local capacity building, and long-term sustainability. In this paper, we describe outcomes of the evaluation in relation to these four principles based on student course evaluations and LMIC supervisor feedback. Using these principles, we aimed to understand the impact of this course on students, clinical partners, and LMIC communities. We were also interested in exploring whether a similar curricular approach could be broadly implemented by medical schools with similar resources and global networks, or adapted by medical schools with limited resources, in order to enhance collaborative, sustainable global health education.

2. Methods

In this international clinical rotation course, students participated in patient care at long-standing partner sites in low- and middle-income countries. Sustained engagement with these sites for more than a decade has provided reliability in the clinical experience and maintained global health partnerships. Partner sites include an urban tertiary care teaching hospital (Jordan), a rural district hospital (Kenya), and a rural health clinic (Guatemala). Beyond these sites, students can propose an "alternate site," such as at a teaching hospital in Peru or a clinic run by a non-governmental organization in India, if the site better meets the student's learning objectives. From 2012 to 2022, 121 students participated in this course with 68% of students rotating with one of our partner sites.

This course includes a structured curriculum with pre-departure training, online video lectures, journal articles, 40+ hours of weekly on-site clinical activity in inpatient, outpatient, and community settings, remote mentoring, and online discussion boards. Didactic activities and clinical immersion are guided by eight course competencies (Table 1). The course materials provide students an understanding of diseases and challenges in LMICs through the foundational sciences including epidemiology, equity, ethics, health policy, and health systems (Dahlman et al., 2018). While course didactics focus primarily on health systems and disparities, students rotate in a variety of specialty clinical areas depending on site-specific resources. In certain sites, students engage in language training provided by a third party, which augments their experience and efficacy at the clinic and in the community.

At the end of each course, students submit course evaluations and host-site clinical supervisors (either physicians or clinical officers, depending on the facility) submit observational assessments of students as well as course feedback forms. Supervisors rank a student's

TABLE 1 Global health immersion course competencies and milestones.

Course competencies	Course assessments
Upon completion of the course, students will be able to: • Assess complexities of global health issues from multiple perspectives. • Examine determinants of global health and development from an interdisciplinary and foundational science vantage point. • Apply relevant foundational science to conditions encountered at host site. • Compare diverse approaches to health issues across multiple contexts. • Participate in and analyze the scientific foundations of interventions used to ameliorate health and developmental problems. • Encounter and participate, under supervision, in diagnosing and treating medical problems, including ones that are uncommon in the US. • Discuss community development, social justice, and human rights principles as they are applied in global health. • Contribute to the clinical and foundational science understandings of colleagues in the host country institution.	Students are assessed on six standard VUSM curriculum competency domains and milestones, including: • Medical knowledge • Patient care • Interpersonal communication • Practice-based learning and improvement • Systems-based practice • Professionalism Assessment of students' competencies is based on their engagement at the clinical site through site supervisor evaluation, review of written history and physicals, weekly discussions, and the CME presentation.

behavior on selected Accreditation Council for Graduate Medical Education (ACGME) milestones[1] as well as the impact of the student on the environment using a four-point scale from *below average* (1) to *exceptional* (4) and write comments about the student's performance. Student evaluations included questions with four- and six-point Likert scales for students to indicate perceived quality, agreement, frequency, or importance of the question topic. Students further described their experiences in free-response fields. We calculated means and standard deviations for quantitative data. We used consensus to categorize qualitative data based on Melby et al.'s principles. Over the ten years this course has been implemented, there have been slight changes (e.g., questions added or removed) in measurement tools resulting from modifications in the medical school assessment processes, which impacted the number of students that completed each item.

In designing and implementing the course and evaluation tools, we used Melby et al.'s principles to create and assess how the course aligned with best practices for STEGH. The principles were applied in the following ways:

Principle 1 – skills building in cross-cultural effectiveness and cultural humility: in the months prior to departure, students complete training in cultural humility, ethics of engagement, professionalism, risks of traveling abroad, and understanding culture shock. Additionally, students develop learning objectives to supplement site- and module-specific objectives. Weekly mentoring calls with Vanderbilt faculty focus on ethical and culturally appropriate engagement and course reflections help students continue to process their experiences abroad.

Principle 2 – foster bidirectional participatory relationships: course leaders and local clinical staff (including physicians, clinical officers, nurses, laboratory technicians and/or community health workers) support bilateral collaboration, reverse innovation, and reciprocal opportunities. In bidirectional exchanges, students are peer mentors for visiting medical students from their host site. During the course, students work in collaborative, interprofessional teams depending on the site (including various cadres of clinical and non-clinical staff) and are assessed on teamwork and systems-based practice.

Principle 3 – promote sustainable local capacity building and health systems strengthening: students contribute to strengthening long-term capacity in health care, public health, and health systems through their capstone project. During the first weeks of the course, students collaborate with their clinical supervisor and other clinical staff (which may include physicians, clinical officers, nurses, laboratory technicians and/or other allied health professionals) to identify a project that is beneficial to the LMIC host site. Each student capstone project is focused on increasing knowledge and/or skills of an identified disease or condition during weekly continuing medical education sessions held at the local facility.

Principle 4 – community-led efforts focused on sustainable development: at most sites, students participate in community health activities led by the clinic including health education classes at local schools, water and sanitation workshops, and cooking classes. To ensure applicability and sustainability of the course, course leaders regularly monitor and evaluate the impact of this STEGH.

Ethics approval was received from Vanderbilt University Medical Center (#221706).

3. Results

Between 2012 and 2022, 85 students and 30 clinical supervisors completed course evaluations, and these formed the basis of our analysis. Based on the four principles outlined by Melby et al. (2016), our data indicate that the structure and content of this course aligns with suggested best practices for STEGH.

3.1. Principle 1: skills building In cross-cultural effectiveness and cultural humility

3.1.1. Student perspectives

Student course evaluations suggest that students gained cultural humility through pre-departure modules and workshops and in clinical rotations (Table 2). Students (94%) agreed that the pre-departure training prepared them for the immersion experience. In questions related to developing cultural humility, students (99%) agreed that the clinical environment consistently reflected sensitivity to issues of culture, gender, race, religion, and sexual orientation and/or identity.

In open-ended responses on course evaluations, most students (78%) described how the opportunity to learn and practice medicine in another setting enhanced their cultural humility, knowledge, and skills (Table 3). Students' clinical experiences and engagements with patients helped them understand the ways that one's culture impacts their perception of health care. Through this new understanding, students wrote about becoming more culturally sensitive in their clinical practice. Students described the unique perspectives they gained that included caring for the whole person and the community.

3.1.2. Supervisor perspectives

Almost all supervisors rated students' depth of knowledge (97% of supervisors gave top ratings), performance in learning and improvement (97%), and their approach to learning (93%) highly (Table 4).

Nearly half (48%) of supervisors' comments described students' progression of learning. Comments included "willingness to learn," "active engagement in seeking further details," possessing a "strong understanding of medical knowledge," and "very participatory, showing her interest in helping and learning new things, we are very happy to have had her in the clinic."

3.2. Principle 2: foster bidirectional participatory relationships

3.2.1. Student perspectives

All students agreed that the clinical experience contributed to their development as a physician. They agreed that they developed

1 ACGME milestones include Patient Care PC2A & PC7A; Interpersonal and Communication Skills IPCS7B & IPCS7B.1; Medical Knowledge MK2A, MK2B, MK7A, MK7B, & MK7C; Practice-based Learning and Improvement PBLI3 & PBLI3A; Systems-Based Practice SBP2A; AND Professionalism PR1B.

TABLE 2 Student course evaluation questions.

	Percent (*n*) of students who *agreed* or *strongly agreed*	Mean Rating (SD) [measurement scale; 1 is low]
Principle 1		
Course/clinical environment reflected appropriate sensitivity to culture, gender, race, religion, and sexual orientation and/or identity	99% (*n* = 69)	4.69 (0.33) [scale 1–5]
Pre-departure modules prepared me for the month away	94% (*n* = 85)	5.11 (1.01) [scale 1–6]
Principle 2		
I developed a greater respect for other health care professions and their roles in providing health care	98% (*n* = 53)	4.78 (0.34) [scale 1–5]
I developed skills that will help me work effectively in a collaborative practice environment	98% (*n* = 53)	4.74 (0.31) [scale 1–5]
Course informed and changed my medical practice	95% (*n* = 44)	4.64 (0.88) [scale 1–6]
Principle 3		
Giving a continuing medical education (CME) presentation was an appropriate course assignment	90% (*n* = 73)	5.04 (1.10) [scale 1–6]
Principle 4		
The community outreach opportunities enhanced my learning experience	99% (*n* = 74)	5.39 (0.75) [scale 1–6]

TABLE 3 Percentage of students' comments that align with each principle (some comments aligned with multiple principles).

Principle	Selected student comments	% of students
Principle 1	I learned an incredible amount about how culture influences health care delivery and I have become a more culturally aware and respectful provider. Having the opportunity to experience healthcare [there] was very beneficial and will certainly help me become a better and more culturally sensitive physician one day.	74%
Principle 2	I learned so much from all of my providers and look forward to sharing those lessons with my colleagues at Vanderbilt.	46%
Principle 3	I visited one of the most efficient and community-focused healthcare systems in the world and learned so much about how to deliver quality care to people from all socioeconomic backgrounds	3%
Principle 4	This placement gives a unique perspective on caring for the whole person in addition to the community at large-this is something that is valuable to all students, regardless of any intention to pursue a career in Global Health.	28%

TABLE 4 Clinical supervisors' perceptions (*n* = 30) of students' performance and presence.

	Percent of supervisors who gave a rating of 3 or 4	Mean Rating of Students(SD)
Principle 1		
Learning and improvement	97%	3.7 (0.5)
Depth of medical knowledge	97%	3.5 (0.6)
Approach to learning	93%	3.5 (0.6)
Principle 2		
Benefit of the student's presence at the hospital/clinic	97%	3.6 (0.6)
Teamwork / Systems-based practice	97%	3.5 (0.6)
Professionalism	93%	3.6 (0.6)
Principle 3		
Benefit of the student's presence among co-workers	90%	3.6 (0.7)
Communication	97%	3.4 (0.6)
Principle 4		
Benefit of the student's presence in the community	92%	3.5 (0.6)
Benefit of the student's presence on the patients	93%	3.4 (0.6)
Patient care	100%	3.7 (0.5)

Scale 1–4 (1 = below average; 2 = good; 3 = great; 4 = exceptional).

skills to work in collaborative practice (98%) and a greater respect for other health care professions and their roles in providing health care (98%). Students (95%) reported that their STEGH informed their medical practice, and 95% indicated they will use information from the experience in their careers.

In open-response questions, nearly half of students (46%) reflected on applying lessons and ideas from their clinical experience abroad to their practice at home. Students reflected on expanding their clinical knowledge through learning from incredible physicians and forming meaningful professional and personal relationships. They learned from an array of providers and built lifelong partnerships with their clinical team. They discussed sharing what they learned with colleagues once they were back at school.

3.2.2. Supervisor perspective

Clinical supervisors (97%) reported that students were a benefit to the clinic. Most supervisors (97%) rated students' performance in teamwork and systems-based practice highly and 93% rated students highly in professionalism. In addition to our students going abroad for clinical rotations, we foster bidirectional participatory relationships through established memoranda of understanding (MOU) for bidirectional educational exchanges with several of our long-term LMIC partner institutions. These exchanges support medical students from partner teaching hospitals to rotate at VUSM. Our students reciprocate the peer mentoring they receive during the course and help orient visiting students. We recognize there are other ways to further enhance bidirectional partnership, but these are the ones highlighted in this case.

Many comments from supervisors about student performance focused on collaboration and engagement with patients and the clinic. Comments that exemplified this collaboration included, "a team player, proactive and was always seeking alternative opinion for the benefit of the patients" as well as "attentive to the needs and concerns of her teammates".

3.3. Principle 3: promote sustainable local capacity building and health systems strengthening

3.3.1. Student perspective

During the rotation, students collaborate with their site supervisor to identify a capstone project of mutual benefit that will strengthen local capacity. Students then build out the project, which is generally in the form of a continuing medical education (CME) presentation to clinic staff. Most of students (90%) felt the presentation was an appropriate course assignment and a way to use their skills to give back to the clinic.

3.3.2. Supervisor perspective

In feedback forms, 90% of supervisors reported that the students' presence was a benefit to the clinical staff. Nearly all supervisors (97%) noted that students communicated well with clinic staff and patients, although some supervisors noted language barriers and suggested that students improve their proficiency. Overall, supervisors commented that students positively contributed to strengthening aspects of the clinical group. One supervisor noted that their student was "ready and willing to learn and also share his knowledge with the rest of the team," and another supervisor commented that "she has added depth and insight to our program."

To further support capacity strengthening, VUSM faculty have visited sites to collaborate with clinical providers and provide additional CME opportunities. At one site, regular remote (virtual) case study conferences between LMIC clinical officers at the rural hospital and VUSM faculty physicians provide opportunities for the clinical officers to discuss and receive guidance on difficult cases from VUSM specialists. Additionally, VUSM faculty and site supervisors have presented together at international global health conferences, which helped broaden opportunities for capacity strengthening at those sites.

3.4. Principle 4: community-led efforts focused on sustainable development

3.4.1. Student perspective

Particularly at clinics where we have long-standing partnerships, students participate in a variety of community outreach initiatives. Over the years, students have engaged in mobile ultrasound clinics, cataract camps, nutrition and cooking classes, dental hygiene classes at schools, sexual and reproductive education for adolescent females, and water and sanitation workshops. Students (99%) agreed that community outreach opportunities enhanced their learning experiences.

In open-response questions, 28% of students highlighted community engagement. For some students, these community experiences were a cornerstone of their learning and taught them about community-focused healthcare and how to deliver quality care. They learned how a community-based approach to health care could be integrated into the health care system and discussed the positive impact these experiences would have on their career.

The course has expanded opportunities beyond the month to include collaboration on global health case competitions, which have brought international partners to Vanderbilt to judge student proposals to address pressing issues in their communities in countries. Some of these cases have included efforts to improve non-communicable disease care through expansion of Lwala's health services in rural Kenya and to improve health outcomes through expansion of access to emergency services in rural Guyana. Medical students have also integrated the course into research immersions that span multiple months which has allowed for co-creation of research and co-authorship of publications (Starnes et al., 2018, 2021; Heerboth et al., 2020; Banerdt et al., 2021a,b).

3.4.2. Supervisor perspective

Supervisors observed that the student's presence benefitted the community (92%) and patients (93%). All supervisors rated their students' performances in patient care highly. Through comments about students' clinical performance, supervisors indicated that students engaged deeply with patients and the community. Such comments included "able to navigate the cultural nuances of medical care in rural Kenya," "fostered a special doctor-patient connection," and "actively participated in areas that seek to improve patient care." Many students worked with community outreach teams to engage in community health promotion

activities outside clinical time. Engagements in these community-led efforts were often mutually beneficial. One supervisor noted that the student "both gained from and contributed a lot to the [community] environment."

4. Discussion

This global health course was evaluated using Melby et al.'s four principles to ensure that it was aligned with best practices in the field. While frameworks like Melby et al. have been used to develop global health programs, we have not found these frameworks to be used in global health program evaluation. This paper seeks to expand use of equity frameworks to ensure cross-cultural effectiveness, mutual benefit, sustainability, and positive community impact in STEGHs.

In this evaluation, we found during the ten years that we have partnered globally with partners on the course, there have been positive outcomes for both US medical students and their host communities as evaluated by their LMIC supervisors. Based on qualitative and quantitative data, the course appears to be effective in addressing the four guiding equity principles. Student course evaluations, supervisors' observations of students, and supervisor feedback forms indicate that students developed cultural humility, acquired foundational science knowledge and relevant skills, and were likely to change their future medical practice habits. Clinical supervisors' observations and feedback revealed that students' engagements with the clinic, staff, patients, and community were beneficial.

The course provides an opportunity for students to view diseases in LMICs through the lenses of population science, epidemiology, public health, and health systems. The course also encourages a bidirectional participatory relationship and capacity strengthening through local mentorship by clinicians and CME presentations by students. The combination of robust didactics, mentoring, and international clinical experience lays a strong foundation for future clinicians.

4.1. Limitations

While there are multiple stakeholders of interest in evaluation of this course, our data only capture perspectives of HIC medical students and their LMIC supervisors. In the qualitative analysis of supervisors' comments, a few supervisors had multiple students and comments were redundant or contained similar phrasing, which resulted in larger tendencies for certain trends. Additionally, not all students and supervisors provided complete course evaluations, so response bias could have influenced the results. Because communities and clients in the LMIC settings were not surveyed, we cannot measure specific impacts of the course, but LMIC supervisor feedback was used as an attempt to understand impact locally. Future studies could expand data collection to include these stakeholders. Questions and scales in the tool were slightly modified over time because of changes in the medical school evaluation approach, which decreased the amount of longitudinal data available. To compare responses across survey questions and instruments, percentages were used to quantify the data. Furthermore, course evaluations were originally developed for quality improvement purposes, so many questions focused on the relevance of didactic materials and activities as well as travel and site logistics to understand students' needs. Additionally, during the ten years of course implementation, several improvements were made: pre-departure preparation was expanded to enhance training in cultural humility and global health ethics; online discussion boards among students at multiple sites were added; and course elements, including objectives, module videos and readings, and assessments were updated to address evolving student interests and global health topics. Despite these changes, the data was consistent from year to year.

4.2. Conclusion

This innovative clinical global health medical school rotation course with long-standing partners in international low-resourced settings addresses guidelines for implementing STEGH. Based on the data available from HIC student course evaluations and LMIC supervisor evaluations, we find that this model appears to be effective and impactful in preparing students for an increasingly globalized world. Future studies would benefit from evaluating the impact of this STEGH on the communities, local staff, and local students (if applicable) as well as the longer-term impact of the course on alumni. In particular, data collection focused on Principle 3 (sustainability), of which we had limited data would add further insight to the impact of this course on communities. Additionally, the course itself could be enhanced through deepening communication and partnerships with clinical sites, furthering bidirectional student exchanges, and continuing to prepare students through robust pre-departure training. While much can be gained through an intensive one-month global health course, more sustained engagement through advanced clinical training and research will likely improve skill development and strengthen bilateral partnerships That said, we believe that this could serve as a model in developing international clinical rotations to address growing interest in global health training in medical schools.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

The study was reviewed by the Vanderbilt University IRB, which determined that the study posed minimal risk to participants and met 45 CFR 46.104 (d) category (1) for exempt review. Vanderbilt University IRB study #221706.

Author contributions

MM, ER, EJ, and DH contributed to the conception or design of the evaluation. ER collected and analyzed the data. MM and ER wrote

the first draft of the manuscript. EJ and DH edited the manuscript. All authors contributed to the article and approved the submitted version.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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University consortium to address public health priorities and research capacity building in the Caribbean

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The State University of New York (SUNY) – University of the West Indies (UWI) Health Research Consortium (HRC) was implemented in 2015 by the SUNY Global Health Institute (GHI) and the SUNY-UWI Center for Leadership and Sustainable Development. The goal was to advance public health in the Caribbean through collaborative research and education among faculty and students at SUNY and UWI. The Consortium is now a dynamic matrix addressing health priorities that were initially agreed upon with the Jamaica Ministry of Health and Wellness. The HRC has built a foundational matrix that is planning for cutting edge laboratory instrumentation, biomedical informatics system, seamless electronic medical records network, national laboratory data management system, and novel biotechnology (e.g., robotic surgery cluster). The SUNY-UWI partnership fills existing gaps through collaborative programs with the SUNY GHI that facilitate UWI faculty interactions with SUNY faculty and core resources and incubators that encourage collaborations while UWI infrastructure expands. The Health Research Consortium utilizes existing academic models at UWI and SUNY to promote collaboration, capacity building, and program implementation. Consortium teams develop sound business development models that foster sustained economic growth and form the pipeline for workforce development

and career opportunities. The Caribbean diaspora and UWI alumni are engaged in working together on this effort. In addition, mentoring in K-12 and beyond is needed to create a vision for the next generations.

KEYWORDS

public health, Caribbean, Caribbean (Jamaica), health priorities, capacity building, global health

Introduction

The Caribbean nation-states and the greater Latin America region have a complex history, from the era of African enslavement and colonialism to the geopolitical and environmental challenges of modern times (Hickling, 2010; Gahman et al., 2021; Barthélemy et al., 2023). This history has led to the current health inequity and public health challenges (i.e., educational disparities that contribute to higher risk for cardiovascular disease risk factors; Ferguson et al., 2017) that require sustainable development and capacity building of regional health system infrastructure and clinical, biomedical and translational research (Cassells et al., 2022). Like other Caribbean countries and developing nations worldwide, Jamaica's principal health concerns include non-communicable diseases, injuries, and infectious diseases (GBD 2019 Viewpoint Collaborators, 2020). Noncommunicable diseases (NCDs), which include heart disease, diabetes, and cancer, are a significant public health concern and cause 79% of mortality in Jamaica (World Bank, 2019). Approximately 34% of NCD deaths have their onset before 70 years of age (World Health Organization, 2018). Furthermore, the aging population of Jamaica is growing and at higher risk of NCDs thereby increasing the burden on the healthcare system (Pan American Health Organization, 2017). Injuries stemming from motor vehicle accidents, falls and violence are also a major, and oft underrecognized public health crisis in Jamaica, throughout the rest of the Caribbean, and globally (Crandon et al., 2008, 2009; Fletcher et al., 2019). Infectious diseases, especially vector-borne diseases, remain a major concern in the Caribbean region due to their susceptibility to climate change (Mora et al., 2022). In addition, recent awareness of the impact of climate change and the need for regional health informatics systems are important factors to consider in developing sustainable public health programs.

The State University of New York-University of West Indies (SUNY-UWI) Health Research Consortium was established through a joint memorandum of understanding between SUNY, UWI and the Ministry of Health and Wellness, Jamaica in 2015 to advance a regional effort to achieve health equity by conducting collaborative investigations to create new public health guidelines and build biotechnology infrastructure. The mission of the consortium is focused on identifying priority areas in the Caribbean that require immediate action (Figure 1) and to form faculty teams including individuals and research cores to address current challenges, rather than waiting for capacity building efforts. To address the regional challenges across multiple key health challenges, the consortium has developed a matrix that builds infrastructure in areas like health informatics, laboratory biotechnology, and research administrative support, while implementing programs that foster multidisciplinary teams, such as a pelvic oncology center, an infectious diseases research center, a diabetes and nutrition initiative, a community health strategy for managing autism spectrum disorders, and a neurosciences program that spans neurology, neurosurgery, and mental health. Similar global health consortiums include the Consortium of Universities for Global Health (with over 175 institutions around the world), as well as the McMaster and Maastricht University Global Health Consortium (with seven institutions spanning 5 continents); the SUNY-UWI Consortium shares their mission of increasing awareness, funding, and capacity building for global health issues.

Infectious disease

The Caribbean is confronted by multiple waves of epidemic arboviruses including dengue, Zika and chikungunya. These insults overlay high rates of infectious diseases, including HIV/AIDS and hepatitis. Recently, SARS-CoV-2 and Mpox have emerged as serious threats to public health.

In Jamaica, there are approximately 30,000 adults and children currently living with HIV and 14,000 who are on antiviral therapy/have suppressed viral loads (UNAIDS, 2021). HIV stigma affects multiple groups including men who have sex with men (MSM) and the homeless. HIV prevalence among adult incarcerated men in Jamaica was 3.3%, compared to a prevalence in the range of 20% for MSM, one of the highest in the world (Andrinopoulos et al., 2010; Figueroa et al., 2015). Sex work, multiple partnerships, incarceration, non-injecting drug use, and female rape were common factors among HIV in homeless people in urban centers (Skyers et al., 2018). Liver disease due to hepatitis is also a major health challenge in the region. Hepatitis A has a seroprevalence of approximately 59.9%, similar to other developing countries (Brown et al., 2000). Herpes simplex virus type 2 has a declining seroprevalence of 20.6% but remains as the cause of nearly half of GUD cases and almost all genital herpes cases (Harfouche et al., 2021). Arboviruses such as dengue and chikungunya reach over 80% seroprevalence in Caribbean populations, and zika has a seroprevalence of 15% in pregnancy, meaning arboviruses continue to be a significant burden in this region (Christie et al., 2023). The effects of multiple circulating viruses in an endemic area with high rates of chronic non- communicable diseases is not well understood.

The COVID-19 pandemic and Mpox outbreak also raised global health concerns. Jamaica had more than 150,000 confirmed COVID-19 cases and 3,500 deaths as of May 2023 (PAHO, 2022). Among COVID-19 deaths, 96.9% were unvaccinated cases that demonstrates the importance of vaccination in Jamaica (COVID-19

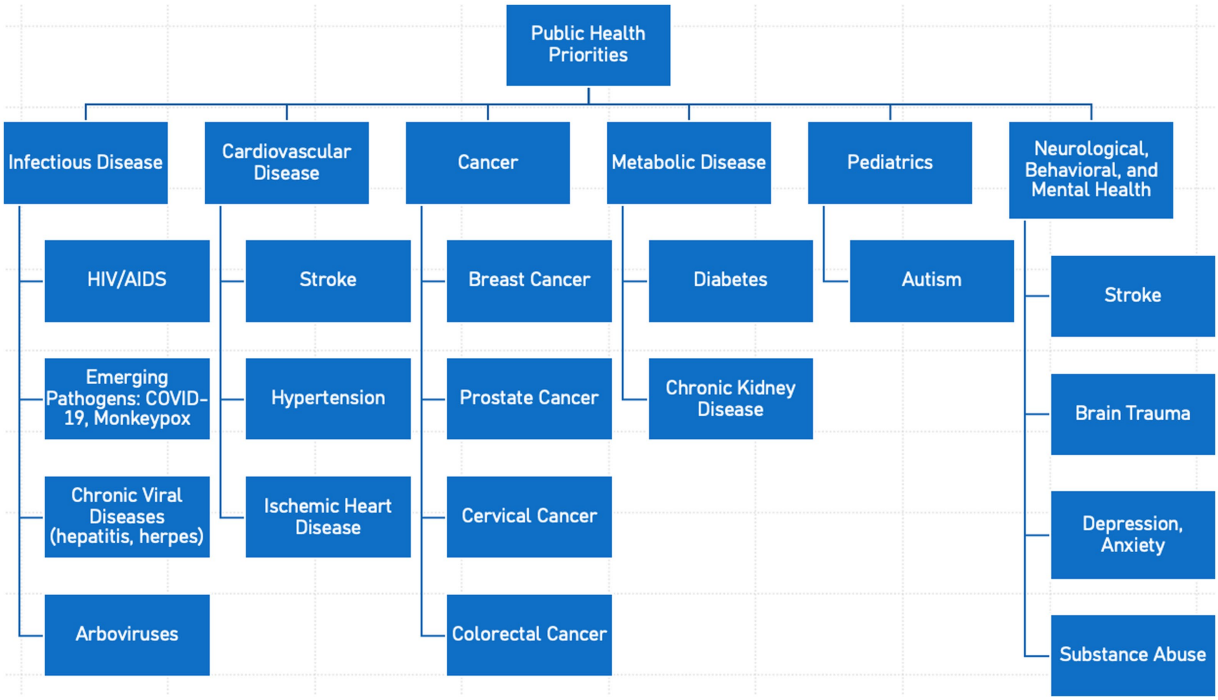

FIGURE 1
Summary of public health priorities.

Clinical Management Summary, 2023). Yet only 27% of the population is fully vaccinated (Our World In Data, 2023), due to vaccine hesitancy or lack of access. The first reported serosurvey for SARS-CoV-2 post-Omicron indicates that although there was high SARS-CoV-2 population immunity, wider vaccination coverage would have delivered significant benefit as much of the population lacked spike RBD IgG (Anzinger et al., 2022). After genomic surveillance of SARS-CoV-2 was implemented in the Caribbean, findings showed the need for expanded digital infrastructure within both local academic institutions and national public health laboratories to better collect and integrate genomic sequencing data across the country and bolster genomic surveillance capacity (Sahadeo et al., 2023).

The Mpox outbreak in 2022 did not reach the severity of COVID-19. Jamaica had 21 pox cases and no deaths (Centers for Disease Control and Prevention, 2022), but the Ministry of Health created protocols for case reporting and investigation, contact tracing, and quarantine (Ministry of Health Jamaica, 2022a). The lessons learned from COVID-19 were applied to better organize the Mpox response. Systematic priority setting is crucial for allocating resources to groups in case future outbreaks occur.

The Consortium has responded to the viral threats through human resource capacity building and expansion of consortium partners for effective response. To address this public health priority, the University at Buffalo (UB)/SUNY, Upstate Medical University (Upstate/SUNY) and the UWI Mona Campus (Kingston, Jamaica), in collaboration with the Jamaica Ministry of Health and Wellness (MOHW), successfully competed for a D43 Global Infectious Diseases (GID) Research Training Program grant with a focus on virology research training and capacity building. The D43 program has received strong support from the UWI and SUNY leadership and has been renewed successfully. This initiative involves colleagues from UWI (Mona and St Augustine campuses) UB, SUNY Downstate and Upstate Medical University. The work is further supported by an Immunology Core located at Rush University with omics support from Case Western Reserve University. The goals of the first 5-year award included 10 pre-doctoral and 10 post-doctoral trainees with a focus in virology. The renewal goals include expanding the current core of early-stage global infectious diseases investigators, utilizing a cutting-edge curriculum with mentored core laboratory experiences that emphasize research design, methods and analytic techniques to address virology research questions that confront Jamaica, providing research training with a multifaceted, integrated mentoring program based on an Individual Development Plan for each trainee that fosters innovative research and enhances the trainees' ability to conceptualize and investigate research problems with increasing independence, and the continued development of independent research leaders in virology who will be competitive for extramurally funded research, mentor the next generation of pre-doctoral and post-doctoral trainees and build on the foundation created during the initial GID award period. GID trainees have focused on the application of novel new biotechnologies (e.g., next generation sequencing, flow cytometry) and bioinformatics.

The consortium has added supporting partners such as the Global Virus Network by the establishment of an Affiliate Center of Excellence at the Mona campus in Jamaica. The efforts of the consortium were also strengthened by the Jamaica becoming a member of the Abbott Pandemic Defense Coalition (Averhoff et al., 2022). This offered resources including equipment, reagents, training,

and next generation sequencing services to support viral surveillance and virus discovery.

Several alumni of the Fogarty training program have been appointed to faculty positions and continue research in emerging viral infections. This includes virus surveillance and discovery in humans and the mosquito vector, drug development, RSV epidemiology and the development of long COVID-19 in children. The virus research activity and the presence of the National Influenza Center influenced the decision of the Ministry of Health and Wellness to establish Jamaica's NGS service for COVID-19 at the UWI.

Cardiometabolic and neurologic diseases

Cardiovascular diseases are the most prevalent (25%) of the NCDs in Jamaica (World Health Organization, 2018). Hypertension and diabetes mellitus are major modifiable risk factors to stroke (Chen et al., 2016). Stroke, ischemic heart disease, and hypertension are some of the top causes of mortality in Jamaica and increase with age (Pacheco-Barrios et al., 2022). Among those over 60 years of age, the most prevalent NCD was hypertension at 61.4%, which increased from 41.4% in 1989. Hypertension prevalence increases with age (Mitchell-Fearon et al., 2014) and may lead to serious cardiovascular disease. A blood pressure screening campaign in Jamaica with 2,550 participants identified 1,055 (41.4%) who had hypertension, and 31.1% of those with hypertension were unaware of the condition (Nwokocha et al., 2019). More emphasis on community awareness and managing risk factors is needed. Jamaica's Health Screening Strengthening Programme has implemented a chronic care model to address NCDs and risk factors (Health Systems Strengthening Programme, 2022).

Type 2 diabetes mellitus and hypertension are the most common causes of chronic kidney disease (CKD) in Jamaica (Ministry of Health, 2020). There is a high prevalence of diabetes in the Caribbean and if untreated may cause multi-organ health complications including stroke, heart disease, renal failure and blindness. Prediabetes is asymptomatic and requires screening programs for detection. Data from the United States Centers for Disease Control and Prevention indicate that prediabetes often leads to type 2 diabetes and related cardiometabolic complications including heart disease, and stroke, affecting 13.7% of Jamaicans (Wilks et al., 1999). Impaired fasting glucose is less common occurring in ~3% (Cunningham-Myrie et al., 2013). Risk factors for prediabetes can be managed with a team approach that must be combined with screening programs for early detection.

Diabetes and hypertension can lead to CKD. A study at the UHWI Diabetes Clinic showed that most patients had CKD and were at high or very high risk of adverse outcomes (total mortality, cardiovascular disease, and renal failure) (Ferguson et al., 2015). Limited economic resources hinder access to crucial dialysis treatment for those affected by CKD. Approximately 50% of persons with kidney failure are working-class, and more than 20% may not be receiving dialysis due to cost (Kramer et al., 2018). More resources must be allocated to screening programs, diabetes, and hypertension prevention, and providing access to CKD treatments.

Neurological diseases comprise a significant public burden in Jamaica and throughout the Caribbean and Latin America. The unmet need for neurological and neurosurgical health care in the Caribbean has been documented for over half a century, but disparities in access to equitable neuro-health care in Jamaica and throughout the Caribbean persist (Spillane, 1969). In addition to nervous system complications of cardiometabolic disease, such as stroke and diabetic neuropathy, burdensome neurological disorders in the region range from common pathologies such as epilepsy, dementia, headache disorders and traumatic brain injury, to less common or more underrecognized conditions such as tropical ataxic neuropathy, neuromyelitis optica and neurotoxicological complications of lead or pesticide poisoning (Rahbar et al., 2015; Hendriks et al., 2021; Ibanez et al., 2021; Li et al., 2021; Pacheco-Barrios et al., 2021; Gracia et al., 2022; Rolle et al., 2022; Zúñiga-Venegas et al., 2022; Pacheco-Barrios et al., 2023). Comprehensive programs for prevention and treatment of these neurological disorders must therefore consider health system vulnerabilities that drive Caribbean neuro-health disparities, such as an inadequate or inadequately resourced neurological and neurosurgical workforce (Perez-Chadid et al., 2023; Santos-Lobato et al., 2023).

The consortium has tested the implementation of an electronic tablet-based system in the development of a diabetes registry at the Kingston Public Hospital. The aim was to develop an efficient and economical registry for the digitization of current and future patients diagnosed with Diabetes Mellitus Type 1 (T1D). The project was led by the University at Buffalo with UWI colleagues from the Kingston Public and University Hospital; of the West Indies (Prescott et al., 2021).

Furthermore, colleagues from the UWI Schools of Dentistry at Mona (Jamaica) and Cave Hill (Barbados) with colleagues from the School of Medicine at UB/SUNY and Rush University have embarked on a program of research training in Periodontitis, Microbiome and Comorbidities in Jamaica. This initiative was recently awarded a 5-year D43 research training grant that will train 5 pre-doctoral and 5 post-doctoral scholars in this area of research.

Cancer

The major cancers affecting the Caribbean include breast and pelvic (prostate, cervical, and colorectal). Breast cancer is the leading cause of cancer-related deaths for Jamaican women with an age-standardized mortality rate of 28 per 100,000 in 2014 (Gibson et al., 2010; Reid et al., 2020). Trends from the past 5 years show that mortality is increasing, in contrast with decreasing mortality rates among US women (Reid et al., 2020). Fear of pain during mammography, subjective indifference, and reliance on physician referrals are barriers to complying with mammographic screening guidelines. Increased efforts are needed to advance screening mammography programs and improve access to treatment (Ncube et al., 2015).

Jamaica has the highest incidence of prostate cancer in the world at 304/100,000 per year, while the Caribbean has the highest rate of prostate cancer mortality globally (Morrison et al., 2014). A 2015 study reported that a substantial proportion of Jamaican men ≥40 years had never been screened for prostate cancer, with uptake in some areas as low as 7% (Anderson et al., 2015). A study at the largest organized screening clinic in Jamaica in 2016 found that compliance with regular maintenance visits and requests for

confirmatory biopsies were poor (Morrison et al., 2016). The stigma associated with digital rectal examinations has contributed to low rates of screening. Early detection for prostate cancer should focus on measurement of prostate-specific antigen (PSA) and prostate exam in men with family history of prostate cancer and begin at 40 years of age or 10 years prior to the earliest age of death form prostate cancer and test ultrasound to improve prostate biopsy efficacy. The use of micro-ultrasound (Laurence Klotz, 2020) could improve staging and prostate biopsy and alleviate the need for 3-paramter MRI, which is not readily available in Jamaica.

Cervical cancer is the second most common cancer worldwide and impacts developing countries disproportionately due to vaccine hesitancy and supply, and social determinants of health such as education. Less than half of women 15–54 years old received screening in Jamaica in the last 3 years, although screening has been proven to decrease mortality (Ncube et al., 2015; Duncan et al., 2021). Pap smear tests and HPV vaccinations are underutilized: a woman who is unaware of where PAP smears are available is 85% less likely to get one and the HPV vaccination rate is only 30% among adolescents (Ncube et al., 2015; Duncan et al., 2021). Research should investigate the value of automated Pap smear interpretation versus visual inspection (Schlecht et al., 2006) and the most cost-effective method to evaluate abnormal pap smears, cervical dysplasia, and cervical lesions using cervix biopsy, colposcopy, and state-of-the-art automated pathology.

Colorectal cancer is the third most common cancer in Jamaica (Gibson et al., 2010; Hanchard et al., 2017) and survival appears worse in Jamaica than in the US despite similar surgical quality (Plummer et al., 2016; Roberts et al., 2020). An early detection program could incorporate fecal blood and DNA screening, CT colography, and/or colonoscopy. To improve outcomes, length-of-stay can be decreased using Enhance Recovery After Surgery (ERAS). Advanced endoscopic procedures, Endoscopic Mucosal Resection and Transanal Minimally Invasive and Endoscopic Microsurgery could replace many major surgeries without decreasing cure rates.

Cervical, prostate, and colorectal cancer early detection and treatment can be routinized using the National Comprehensive Cancer Network (NCCN) 2021 Guidelines® and their 2019 modification for the Caribbean, when appropriate due to resource limitations, which were developed in a two-day in-person meeting during 2018 in Trinidad of the resource-adjusted guideline working groups. Improved treatment also could be guided by biospecimen acquisition to understand variation in cervical carcinogenesis after HPV infection, response to androgen deprivation therapy (ADT) in prostate cancer, and differences in colorectal cancer incidence in Jamaica versus Canada and the United States.

Given the public health burden, excess mortality associated with treatment of more advance cancers due to delayed detection, and the expenses associated with advance cancer treatments, consideration is being given to the establishment of cancer treatment centers of excellence for prostate, colon, and cervical cancers. These sites would facilitate integrated multidisciplinary approaches to care and a more cost-effective deployment of highly specialized diagnostics and therapeutic modalities as well as provide a platform for research and training. The consortium has led an initiative to establish a Pelvic Cancer Center of Excellence at the Mona campus of the UWI working with colleagues from UB/SUNY and Roswell Park Comprehensive Cancer Center.

Pediatrics

Over the last decade, there has been a decline in neonatal, infant and early childhood mortality, with rates in 2021 of 12.4, 10.7, and 10.3/1000 live births, respectively (UNICEF, 2021). In the Caribbean and small island states, the IMR is 14/1000 live births (The World Bank Databank World Development Indicator, n.d.). The most common threats to neonatal health include respiratory and cardiovascular disorders, which are the leading causes of death for children under 5 years from 2011 to 2014 (Pan American Health Organization, 2017).

Being overweight and obese (World Obesity Federation, 2021) and having mental health challenges (United Nations Children's Fund, 2021) are major health issues as children age and have implications for future CNCD. This is compounded by limited access to mental health services and stigma associated mental health diseases. Additionally, STI/HIV infections threaten adolescent health and teenage pregnancy remains common in Jamaica, with limited access to contraception for young people (UNFPA, 2017; Figueroa et al., 2020). The consortium's NIH grant is being actively utilized to scale up a pilot program, Community HIV Adherence and Adolescent Mental Health Program (CHAMP++), to increase access to the mental health workforce through training at treatment sites for HIV-infected adolescents.

During epidemic surges of dengue, severe disease occurs in 1 in 5 hospitalized children, with increased vulnerabilities among those with sickle cell disease and a mortality rate of 5%. Two-thirds of deaths occur within 24–48 h of admission. Dengue, chikungunya and zika arboviral infections contribute to significant morbidity and mortality in Caribbean children (Christie et al., 2023), and due to the lack of approved vaccine treatments in the region, supportive clinical care and early diagnosis is essential. The impact of climate change on arboviral disease epidemiology could have implications on these childhood outcomes (Lue et al., 2022). In the Caribbean, research concerning respiratory diseases among children exposed to volcanic eruptions in OECS territories is relatively unknown. Additional concerns are reduced coverage of vaccine-preventable diseases (VPDs) and vulnerability of the Caribbean to reintroduction of eliminated VPDs.

In addition, autism in Jamaican children is a growing concern with 700 children with autism born each year (Autism Jamaica, 2019); the Jamaica Autism Support Association works to spread awareness, support affected families, and promote inclusivity. However, services are severely limited, and many medications used to treat more severe behavioral disturbances and comorbid disorders are unavailable. The consortium collaboration is still in the exploratory phase, with grand rounds and online consultations planned for 2023.

Mental health and substance abuse

Mental health and substance abuse disorders share four common behavioral risk factors: tobacco use, unhealthy diet, physical inactivity, and harmful use of alcohol (Pan American Health Organization, 2017). Depression and anxiety are the most common mental health disorders in Jamaica with a prevalence of 3.0 and 4.1%, respectively, and are more common in women than men (PAHO, 2019). Premature mortality due to these disorders could be prevented by community-based interventions and increased focus on mental health services. However, substance

abuse remains a concern. The 2016 National Drug Prevalence Household Survey reported that among 4,263 persons aged 12–65, 75% had used alcohol, 30% had used cigarettes and 28% had used marijuana. Alcohol was found to be the most used substance among adolescents with a lifetime prevalence of over 60% in a 2013 UWI study (Pan American Health Organization, 2017).

Important considerations

Genetic diversity

The Caribbean has a long history of interactions among European, African, Asian, and Native American populations. Studies have reported extensive gene flow across the Caribbean that probably result from two pulses of forced African displacement related to the slave trade (Moreno-Estrada et al., 2013). Genomic diversity has a broad positive impact on human survival: within a single population, every standard deviation of heterozygosity an individual has over the mean decreases that person's risk of death by 1.57%, which was consistent between European and African ancestry cohorts, men and women, and major causes of death (cancer and cardiovascular disease) (Bihlmeyer et al., 2014). The SUNY-UWI HRC is establishing partnerships through ongoing genomics research planning with the H3Caribbean project and other members of the Consortium.

Climate change

Increased temperatures that optimize mosquito reproductive cycles and feeding may enable the spread of vector-borne diseases. Droughts and floods also present an obstacle to sustainable development. These environmental issues are compounded by social issues, such as poverty, poorly constructed infrastructure, and communities located in high-risk areas (Pan American Health Organization, 2017). In 2020, Jamaica became the first Caribbean nation to submit a tougher climate action plan to the United Nations (Doyle, 2020). Climate change will only increase, which will stress healthcare infrastructure and capacity building further. To address the important link between climate change and global health the SUNY-UWI HRC is building public-private partnerships with innovative strategies such as decarbonization technologies.

Health informatics

Health informatics, including improved electronic health records, public health surveillance systems, digital imaging, and telehealth technologies, is essential for Jamaica's innovation and progress. Current projects of the Ministry of Health include the E-health Pilot Project, which aims to establish the national electronic Patient Administration System, the ICT infrastructure of the National Health Information Network (NHIN) and supporting initiatives. The E-health Pilot Project is the first step toward universal access to healthcare records at any patient care facility a patient attends while improving the quality of health reports for stakeholders (Ministry of Health Jamaica, 2022b). Their Laboratory Information System (LIS) Project is about 95% completed; the project addresses the efficiency of data management at the National Public Health Laboratory and strengthens the connection with linkage systems. The remainder of the plan outlines six additional strategic goals and corresponding action items and performance indicators to streamline health information systems and improve the quality of care (Ministry of Health, 2013).

The University of the West Indies (UWI), Mona, launched its Hospital Information Management System (HIMS) in 2018. The digitization of patient records aims to streamline healthcare delivery and establish a national repository of medical records (Scott, 2018). However, several setbacks have occurred in the project according to *The Gleaner*. Continued reliance on paper records and uncertainty around the cost-effectiveness of the project have delayed its completion (Johnson, 2021). The UWI Caribbean Institute for Health Research also has a program focused on Health Informatics (Biobank, Routine Data Management, Data Curation) (Caribbean Institute for Health Research, n.d.). Multiple research projects are focused on building a biorepository, improving health data management, and developing a registry for prostate cancer. The SUNY-UWI HRC has brought together key stakeholders in this field and has initiated collaborative projects including cloud-based strategies for disease surveillance.

Discussion

Cardiovascular and metabolic diseases, neurological disease, infectious disease, metabolic disease, injuries, and cancer are the primary areas of public health concern in Jamaica. Neonatal health, mental health, and substance abuse also negatively impact community health and contribute to NCD risk factors. Climate change and health informatics, especially building upon e-Health systems, play important roles in capacity building and ensuring sustainable development. Food security, housing, education, transportation, and cultural considerations are also factors that should not be ignored. As technology continues to develop, e-Health programs must be strengthened to secure patient information, enhance efficiency, reduce costs, increase access to technology, and improve expertise, and thereby improve healthcare outcomes. Recommendations include expanding early detection programs, developing healthcare infrastructure, and capacity building. With a number of successful planning and scientific meetings completed, the SUNY-UWI HRC is now working to establish a UWI Global Health Institute in Montego Bay that will utilize the Western Jamaica Campus as a location for a Caribbean hub that will foster collaborations across the region.

Author contributions

ALi wrote the framework and background information for the paper with the assistance of GM. All authors contributed paragraphs in their specialty of experience.

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Conflict of interest

AE was employed by the company Kingston.

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New medical schools in Sub-Saharan Africa –a cross-sectional survey of educational structures, operations, and policies

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Introduction: Africa does not have enough doctors despite having the highest continental burden of disease. Encouragingly, many new medical schools are opening and have begun to graduate doctors. However, the educational structures, operations, and policies of these schools remain poorly understood. This study aimed to better understand these dimensions of new medical schools on the continent.

Methodology: We developed and implemented an online survey covering topics that included admissions policies, curricular design, assessment, accreditation, faculty development, research capacity, postgraduate training, and COVID-19-specific challenges. The survey was sent to 130 schools of which 52 represented individually identifiable email addresses (the remainder being schools' websites or generic addresses).

Results: Responses represented 10 countries (response rate ~ 56%). Curricula were mostly lecture-based ($n = 18$, 75%). Electronic platforms and information technologies were used by over 75% ($n = 18$) of schools. More than half have not implemented postgraduate training programs ($n = 13$, 57%). Most schools had a formal accreditation process ($n = 16$, 70%), but the source of accreditation varied. The biggest challenge facing schools was financial ($n = 20$, 87%) followed by faculty/staff recruitment, training, and retention (each $n = 15$, 65%).

Conclusion: New medical schools in Sub-Saharan Africa are a gateway to the next generation of medical doctors in a region where medical professionals are desperately needed. This survey of new schools is an important step in better understanding their status and needs, especially with the onset of the pandemic.

KEYWORDS

medical education, Sub-Saharan Africa, pedagogy, curriculum development, global health

1 Introduction

An oft-quoted statistic about health care in Africa is that the continent accounts for 23% of the global burden of disease but harbors only about 3% of the global healthcare workforce (Anyangwe and Mtonga, 2007; Global Burden of Disease Collaborative Network, 2021). How to increase the size of the workforce and adequately capacitate health care on the continent remains an immense and unsolved problem.

A direct approach would be to simply train more doctors and nurses. Additional health professionals are sorely needed especially in Sub-Saharan Africa (SSA) (Frenk et al., 2010; Tsinuel et al., 2016). This training could be achieved either by increasing the intake of students at existing medical schools or by building new schools. Given the large numbers of doctors and nurses needed, existing schools could likely not manage an increased intake. Whereas high-income countries, like the United States of America, have more than 6 medical schools per 10 million people to train health professionals, most countries in Africa have fewer than half that number (Frenk et al., 2010). Establishing new medical schools is a complex challenge especially in low-resource rural settings where they are most needed and where essential associated facilities are limited (Tsinuel et al., 2016; Eichbaum, 2017).

The increased number of new medical schools opening on the African continent is a welcome development (Greysen et al., 2011). Whether all these schools will ultimately succeed in producing doctors remains to be seen. Such well-intentioned initiatives are often constrained by political will, national budgets, and lack of well-trained faculty.

Gaining a better understanding into how current new schools operate and are performing could provide insights for planning new schools. To date however, no such study has been published. New medical schools encounter a range of challenges, including scarce financial resources, infrastructure challenges, faculty, and staff retention issues, and initially low numbers of graduates (Mullan et al., 2011; Eichbaum et al., 2012; Tsinuel et al., 2016). The 2010 Lancet report on global health professional education argued that new medical schools could be nimbler and more innovative than established schools that are often encumbered by "curricula rigidities, professional silos, static pedagogy, (and) insufficient adaptation to local contexts" (Frenk et al., 2010, p. 1,926). New medical schools have the potential to leapfrog over traditional educational models toward creative educational alternatives (Frenk et al., 2010; Eichbaum et al., 2015). Among the innovations considered by new medical schools are technological innovations, new models of assessment, and incorporation of community service-based learning. Yet the extent to which such innovations have been successfully and sustainably implemented has been less examined (Greysen et al., 2011; Mullan et al., 2011; Frambach et al., 2017).

Medical curricula should be contextualized to local and regional healthcare needs (Bleakley et al., 2008; Eichbaum et al., 2015; Tsinuel et al., 2016). Modern medical education is shifting from traditional teaching and assessment methods to learner-centered methods including competency-based curricula, problem-based learning, community experiences, and e-learning, among others (Mokone et al., 2014; Eichbaum et al., 2015; Tsinuel et al., 2016; Barteit et al., 2019). Innovative electronic tools and resources have been proposed to make anatomy more inviting and engaging in SSA through the use of educational games, videos, online sources, and 3D printing (Gbolahan Balogun, 2019). In Tanzania, the adoption of technology-enhanced learning has resulted in increased acceptance of blended learning programs, increased accessibility of learning opportunities, improvements in in-person instruction, and strengthening of international relationships (Mtebe and Raphael, 2017). However, the researchers note that the major limitations for blended learning with technology are infrastructure-related, such as shortages in electricity, internet bandwidth, funding, and government policymaking.

Ideally, establishment of a medical school will be followed by accreditation from a recognized organization (Tsinuel et al., 2016), generally with the support of the national government. The World Federation of Medical Education (WFME) is a global organization established to enhance the quality of medical education worldwide and it certifies medical education accreditors.[1] Although SSA has one of the oldest medical education accreditors in the world, the National Universities Commission of Nigeria, only one accreditor, the Sudan Medical Council, is recognized by the WFME and 48% of countries do not yet have accreditation for undergraduate medical education (Bedoll et al., 2021).

New schools can be innovative regarding student admission policies. In a review of medical school global admissions policies, researchers at Mulungushi University in Zambia suggested that schools in Africa should consider academic as well as non-academic elements in medical school admissions (Ezeala et al., 2020). While academic excellence may predict achievement in the pre-clinical stage, non-academic attributes were reported to be predictive of success in the clinical stages of training (Ezeala et al., 2020). Using selection instruments based on a variety of factors, including socioeconomic status, can help select the most fitting candidates and fulfill a school's social obligation to include students from a variety of backgrounds. Wilson et al. (2009) proposed that to redress the imbalance of urban versus rural medical trainees, new medical schools and satellite campuses should be opened in rural areas. Since trainees from rural areas are more likely to return to work in those areas, an admissions quota could be established for candidates from rural areas (as has been done at the University of Namibia School of Medicine) and preference might be given to candidates intending to practice in rural areas.

In light of the recent COVID-19 pandemic, many academic global health programs, especially in low-and middle-income countries, suffered from reduced scholarly output, education program funding, and negative consequences on research due to disruptions in communication and international travel (Rose et al., 2022). Adaptations and transitions to virtual learning occurred world-wide. Bernard et al. (2021) found that 80% of medical schools in Africa suspended classes due to the COVID-19 pandemic and 59% remained closed months after the suspension. Of the students who resumed classes, 70% reported participating in online classes, 19% hybrid, and 17% in-person. Specifically, in Nigeria transitions to e-learning resulted in little to no effect for students in their preclinical years, but clinical exposure was greatly impacted resulting in the loss of valuable

1 https://wfme.org/

time and a delay in matriculation for health care professionals (Oladipo et al., 2020).

A survey of medical schools in SSA was last conducted in 2012 and provided aggregated information about well-established and newly established schools (Chen et al., 2012). Although some newer medical schools have described their experiences (Mokone et al., 2014), relatively little is known about new schools, especially ones established in the past decade.

The aim of this study was to gain insight into education structures, operations, policies, successes, and challenges of new medical schools established in SSA in the last two decades. A carefully developed web survey was used to gather qualitative and quantitative information about these schools' admissions policies, curricula, preclinical and clinical assessment, evaluation and accreditation processes, research capacity, postgraduate training programs, and faculty development, as well as issues that face these schools and their operating capacities. This article reports on the findings of that survey.

2 Method

Working with colleagues in Africa and Europe, we developed a comprehensive survey in English that covered topics including demographics, funding and partnerships, admissions, curricular structure and resources, postgraduate programs, accreditation, and overall challenges. We developed the survey in Research Data Capture (REDCap), a secure web-based platform for survey development and data storage (Harris et al., 2009, 2019).

Survey question types included multiple choice (single and multiple response), binary measures (yes/no), Likert scales, and comment boxes. The dichotomized questions in the survey asked about whether the medical school had satellite campuses, classes were held during the pandemic, and about plans to resume in-person classes. The two questions in the survey with Likert scales asked about the average age of the admitted student body and percent of the student body that is female. We pilot tested the survey at three new medical schools in SSA with educators who were not respondents in the final survey. We then emailed the online survey and an explanatory cover letter to prospective participants between February 2021 and April 2021. Reminders to complete the survey were emailed a week later and there was no coercion for completion. Prospective participants were deans or other faculty representatives of medical schools in SSA that started admitting students after 1999. We identified these schools and contacts from the WFME website and the Consortium of New South African Medical Schools (CONSAMS).

We collected and stored data in REDCap before exporting for analysis in JASP, Excel, and SPSS. We calculated descriptive statistics, including means and standard deviations, based on the total number of responses for each question. We conducted correlation tests for selected questions based on research from our literature review. We generated graphs, tables, and figures using Tableau.

Ethics approval for this study was received from the Vanderbilt University Medical Center Institutional Review Board (IRB). Participants were assured of anonymity and confidentiality in their responses, and they consented to participate in the study.

3 Results

3.1 Quantitative data

3.1.1 Demographics

We identified 130 new medical schools in name including schools in Portuguese-and French-speaking counties. Obtaining the individual contact information for more reliable responses from each school was problematic. Despite considerable effort, we managed to identify personal contacts and email addresses at only 52 of these schools. For the remaining schools we had only generic addresses (such info@--, dean.med@--, registrar@--, and faculty@--). Given the high number of "undeliverable" responses we received, coupled with a high number that likely went to spam or were ignored, the total response rate (out of 130) was artificially depressed to 29%. However, if we count responses only from those sent to individual email contacts, the response rate was 56%. We argue that the response rate of 56% is more accurate.

Ten countries were represented in the survey responses and most individual respondents were deans at their respective school ($n = 16$, 64%). While the median year that schools began admitting students was 2012, 80% ($n = 20$) were established in 2010 or later (Figure 1). Many institutions were in metropolitan areas ($n = 17$, 68%), while the remainder were distributed in towns ($n = 7$, 28%) and rural areas ($n = 1$, 4%) (Table 1). Some schools had satellite campuses ($n = 6$, 24%). Although the mean gender distribution of school populations was even ($F = 49\%$, $n = 11$; $M = 51\%$, $n = 13$), there was significant variance between schools (standard deviation = 16%).

3.1.2 Funding and partnerships

Most institutions were either public ($n = 11$, 44%) or private ($n = 9$, 36%), while a few represented public-private partnerships ($n = 4$, 16%). Funding for medical schools was primarily from government ($n = 11$, 44%) or private funds ($n = 11$, 44%). Some schools were funded by philanthropic donations ($n = 2$, 8%) and parastatal funds ($n = 1$, 4%). Nearly all ($n = 21$, 91%) reported that their school had formal agreements/working relationships with other universities/training programs. Those relationships were with universities and programs that were within their country ($n = 16$, 76%), within Africa ($n = 14$, 67%), and/or outside of Africa ($n = 13$, 62%).

3.1.3 Admissions

Decisions for student admission were made largely by the medical schools' admissions committee with minimal government input or quotas ($n = 16$, 67%). Most admissions committees were composed of clinical faculty ($n = 15$, 63%). All schools indicated using high school or other entrance exams to determine admission ($n = 24$). A small percentage used interviews ($n = 7$, 29%), holistic qualities ($n = 4$, 17%), or extracurricular activities ($n = 2$, 8%) in addition to high school or entrance examinations.

3.1.4 Curricular structure and resources

All schools had programs that were five to seven years in length, with a six-year degree program the most common ($n = 15$, 63%). The type of medical degree offered was nearly equal between Bachelor of Medicine, Bachelor of Surgery (MBBS) ($n = 7$, 28%); Bachelor of Medicine and Bachelor of Surgery (MBChB) ($n = 7$, 28%); and

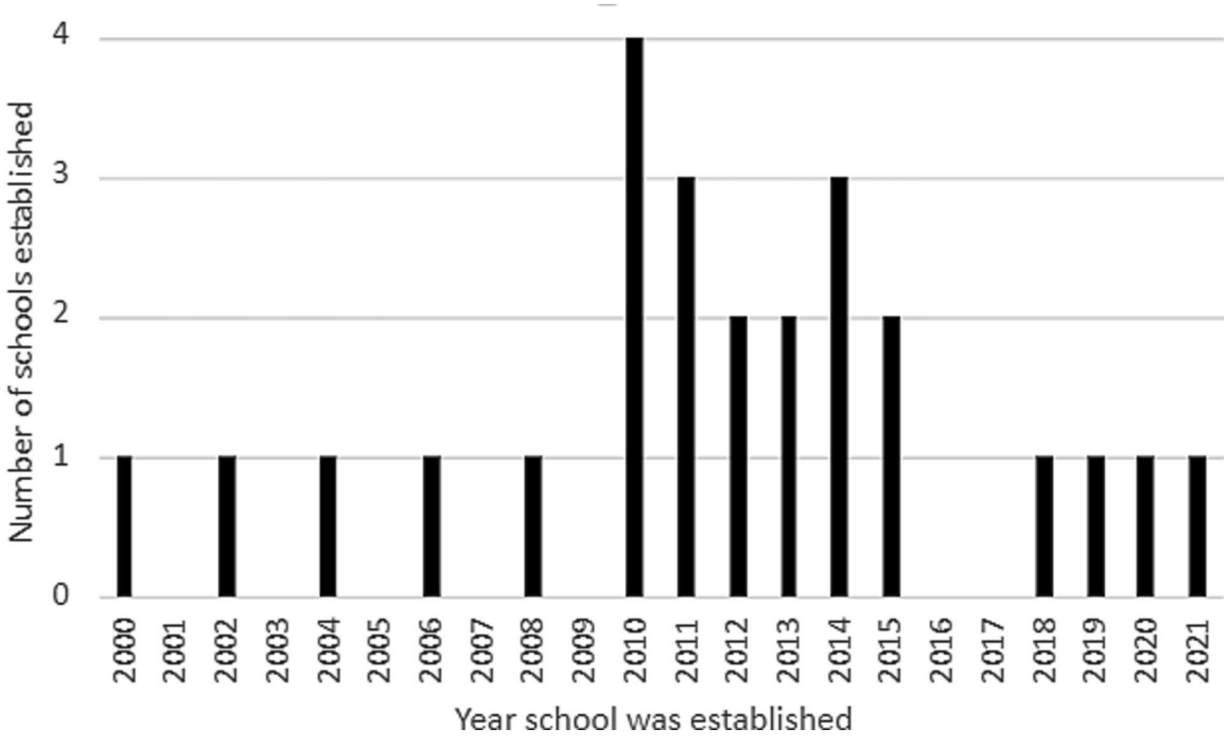

FIGURE 1
Approximate year of establishment of new medical schools in survey, 2000–2021.

Doctor of Medicine (MD) ($n = 10$, 40%). Most schools developed their own curriculum ($n = 18$, 75%) but 21% ($n = 5$) used a curriculum donated from another source (Table 2). Nearly all respondents agreed or strongly agreed that their curriculum was sufficiently contextualized to local needs ($n = 24$). Half of schools used a curriculum with a "traditional" program of two to three years of biomedical science followed by two to three years of clinical training ($n = 12$). Medical schools used various combinations of learning philosophies and methods, including lecture- ($n = 18$, 75%), case- ($n = 15$, 63%), and/or problem-based learning ($n = 15$, 63%). Most schools conducted clinical rotations in the same locale as the medical school ($n = 16$, 67%) and/or in the surrounding health care facilities ($n = 18$, 75%).

Almost all schools incorporated research or research methodologies into the curriculum ($n = 22$, 96%). The research courses included classes on research design ($n = 23$, 100%), quantitative analysis ($n = 21$, 91%), qualitative analysis ($n = 20$, 87%), and ethics ($n = 17$, 74%). Research included in the formal curriculum focused on public/population health ($n = 18$, 78%), clinical ($n = 17$, 74%), and biomedical science ($n = 14$, 61%). Anatomy courses varied in how they were conducted. Many medical schools used synthetic, anatomical models ($n = 15$, 63%) or student participation in dissection of cadavers ($n = 13$, 54%). All schools used multiple methods of anatomy education.

Students' access to paid, online learning resources, like ScholarRx or Lecturio, was rare ($n = 4$, 17%). Most schools ($n = 19$, 79%) included free study resources, like Khan Academy and Coursera, in the curriculum. Many students regularly used an information technology library ($n = 20$, 83%), laptops/tablets ($n = 18$, 75%), and/or smart phone applications ($n = 15$, 63%) for coursework. Over half of schools used a learning management system, such as Moodle or Blackboard ($n = 13$, 54%). Assessment during the preclinical phase included multiple-choice ($n = 24$, 100%), written essay ($n = 21$, 88%), and/or oral ($n = 17$, 71%) components. Students were assessed similarly in the clinical phase; however, practical assessments ($n = 21$, 88%) were also included.

3.1.5 Postgraduate programs

The schools' postgraduate programs offered either few specialties or specialties distinct from the survey response options as many respondents indicated that "none" of the listed specialties were offered ($n = 13$, 57%). However, the most commonly selected specialties of those listed were Surgery ($n = 6$, 26%), Obstetrics and Gynecology ($n = 6$, 26%), and Internal Medicine ($n = 4$, 17%).

3.1.6 Accreditation

Most schools ($n = 16$, 70%) implemented a process of formal accreditation. Of those schools, most were accredited by a national accreditation body ($n = 21$, 91%) and/or an internal quality assurance office/committee ($n = 13$, 57%). Less than half ($n = 11$, 48%) reported that their accreditation guidelines aligned with those set forth by the WFME, while 52% ($n = 12$) did not know if their guidelines aligned with the WFME.

3.1.7 Challenges

The biggest challenges schools faced included financial issues ($n = 20$, 87%), recruitment and retention of faculty/staff ($n = 15$, 65%), and faculty/staff training and professional development ($n = 15$, 65%) (Table 3). In light of the COVID-19 pandemic, financial troubles were exacerbated for most medical schools ($n = 19$, 83%). All but one school still held classes during the

TABLE 1 Demographics and institutional characteristics of new medical schools in Sub-Saharan Africa that responded to the survey.

Characteristics	Percentage
Type of school (n = 25)	
Public	44%
Private	36%
Public-Private Partnership	16%
Location (n = 25)	
Metropolitan Area	68%
Town	28%
Rural Area	4%
Degree offered (n = 25)	
MBBS	28%
MBChB	28%
MD	40%
Length of degree (n = 24)	
5 years	17%
6 years	63%
7 years	21%
Gender of student population (n = 24)	
Female	49%
Male	51%
Funding (n = 25)	
Government financial support	44%
Private funds	44%
Philanthropic donations	8%
Parastatal funds	4%
Formal agreements/working relationships (n = 23)	
National/domestic	76%
International and intercontinental (within Africa)	67%
International (outside of Africa)	62%

pandemic. Many schools ($n = 16$, 70%) held a combination of in-person and online courses, but 22% ($n = 5$) held solely in-person courses and 9% ($n = 2$) were solely online.

We looked for correlation between a variety of dimensions including school demographics, curricular design, accreditation, and challenges but found no significant correlations. The diversity among schools in structures, operations and policies in different countries couples with the relatively small number of schools may have contributed to statistically insignificant associations.

3.2 Qualitative data

In open-ended response questions, we asked about strengths of schools and innovations that the school developed to address challenges. Five themes emerged: management, workforce, infrastructure and resources, curriculum, and partnerships. Respondents described features of strong management practices including teamwork, self-reliance, openness to discussions, transparency, and flexibility. Outputs of their school's work included having a "good reputation in the society," engaging with the community, and improving quality education.

Respondents described their faculty and staff as "passionate," "energetic," "well-experienced," and "dedicated." From these descriptions, it was apparent that respondents were enthusiastic about their workforce. However, respondents mentioned challenges in building their workforce. Some wrote about overcoming this challenge through utilizing "part-time lecturers from other faculties," "virtual lecturers from other schools," and providing training. Others were challenged by part-time, young, or inexperienced faculty as well as low qualifications of lecturers and specialized faculty members.

While some respondents wrote positively about school facilities including an affiliated clinic, laboratories, a library, and lecture rooms, many others described a lack of infrastructure, laboratory equipment, and clinical rotations as well as financial limitations that prevented expansion. One respondent described innovatively "owning our teaching hospital rather than using regional hospitals," which avoided some resource and rotation challenges.

Curriculum was also a common theme among innovations and strengths. Examples included "strong assessment procedures," "curriculum review and development of short courses," and "using a new and different curriculum" than is used nationally.

Other innovations and strengths included building partnerships and signing agreements with other institutions. These partnerships spanned national, international, government, non-governmental, and Christian organizations.

4 Discussion and conclusion

The number of new medical schools in Africa has been rapidly increasing especially in the last decade (Figure 1) (Tsinuel et al., 2016). Although the sample studied in this survey revealed many differences between schools regarding the selected parameters, there were also similarities.

Compelling arguments have been advanced in favor of establishing new medical schools and training hospitals in rural communities because rural areas are where healthcare needs are acute and unmet. Training doctors in these areas could help meet these needs (Wilson et al., 2009; Eichbaum, 2017). Although most schools in our study were in metropolitan areas, a quarter of schools utilized clinical placements in rural areas and one school had distributed campus locations in ten districts and regions. Rural initiatives are known to impact students' decisions to practice in rural areas after graduation (Eichbaum, 2017; Szafran et al., 2020). To increase equity among applicants from rural and urban areas, some schools have used holistic admission criteria decisions (Wilson et al., 2009; Eichbaum et al., 2015), as did a few in our study.

There were similar proportions of public and private schools, indicating that the number of private schools is increasing as there were fewer private schools established in the earlier years of our time range. This increase might be driven largely by the urgent need to graduate more doctors in these countries. Accreditation of such schools confers legitimacy and affirms their ability to produce high quality graduates. Additionally, private schools can operate with more

TABLE 2 Curricular components and characteristics of new medical schools in Africa that responded to the survey.

Components	Percentage
Curriculum structure ($n = 24$)	
Traditional[a]	50%
Inverted Triangle[b]	33%
Integrated[c]	17%
Origin of curriculum ($n = 24$)	
Internally developed	75%
Donated	21%
Unsure	4%
Teaching methods ($n = 24$)	
Lecture-based learning	75%
Case-based learning	63%
Problem-based learning	63%
Team-based learning	38%
Flipped-classroom learning	13%
Curricular utilization of outside learning resources ($n = 24$)	
Free, online learning resources	79%
Paid, online learning resources	17%
Other	13%
Technology used for coursework ($n = 24$)	
Information Technology (library)	84%
Laptops, tablets	75%
Smart phone applications	63%
Moodle/Blackboard	54%
Internet-based coursework	36%
Virtual reality labs/simulation labs	29%
Other	4%
Postgraduate clinical programs ($n = 23$)	
Obstetrics and Gynecology	26%
Surgery	26%
Internal Medicine	17%
Occupational/Public Health Medicine	17%
Pediatrics	17%
Anesthesia	9%
Family medicine	4%
Psychiatry	4%
None of the above	57%

[a]Traditional curriculum (2–3 years of biomedical science, followed by 2–3 years of clinical training).
[b]Inverted triangles curriculum (begins predominantly with biomedical science and gradually transitions to a more clinical focus).
[c]Integrated curriculum (mixture of biomedical science and clinical training throughout all/most years).

TABLE 3 General challenges faced, and impact of the COVID-19 pandemic reported by new medical schools in Africa that responded to the survey.

Elements	Percentage ($n = 23$)
Challenges	
Financial	87%
Staffing	65%
Training faculty	65%
Professional development	65%
Dependence on external resources	30%
Dependence on expatriate expertise or staff	26%
Curriculum development	22%
Continued classes during pandemic	
Yes	83%
No	13%
Unsure	4%
Course delivery method during pandemic	
In-person	22%
Online	9%
Hybrid	70%

autonomy and less government interference (Mokone et al., 2014; Tsinuel et al., 2016). Public-private partnerships have been offered as a solution (Tsinuel et al., 2016). A small percentage of the schools in this study represented public-private partnerships and notably all such schools were established in the last decade, suggesting a trend toward these partnerships.

Accreditation is a vital step for schools. It is concerning that not all the surveyed schools had implemented a process for accreditation and over half did not know if their school was aligned with accreditation guidelines from the WFME. Challenges arise in balancing accreditation standards and tailoring education to meet local needs (Frenk et al., 2010; Eichbaum et al., 2015). Although WFME accreditation provides schools an opportunity for global accreditation, it was developed by Europeans and has been viewed by some as a perpetuation of colonialism and penetration of Western ideas into African education (Weisz and Nannestad, 2021). Critics note that while some accreditors encourage incorporating local perspectives, others continue to promote Western standards for core competencies (Bleakley et al., 2008). Colonialist arguments have also been made against problem-based learning, a popular teaching method and a key component of some accreditation standards (Frambach et al., 2017) and characteristic of some surveyed schools' curriculum.

All schools surveyed had a five-to seven-year curriculum, reminiscent of colonial era curriculum. Respondents noted, however, that their school's curriculum was contextualized to their region despite a quarter of curricula being donated from elsewhere. Contextualization helps ensure that students learn about diseases, diagnoses, and treatments that are regionally and culturally relevant (Frenk et al., 2010). Despite the most common teaching method being teacher-centered and lecture-based, student-centered approaches were used in over half of the schools. Of the schools that utilized student-centered designs, most were established in the past decade, perhaps reflecting current trends toward these teaching methods as well as the innovative capacity of these newer schools. Additionally, it was more common for the newer schools to integrate biomedical science and clinical training throughout the curriculum,

which is an innovative curricular approach and further suggests a trend of newer schools toward innovation (Dahlman et al., 2018).

E-learning and telehealth provide potential solutions to training medical professionals and mitigating the impact of health worker shortages. Prior to the COVID-19 pandemic, e-learning was underdeveloped globally and particularly in SSA, needed more funding and needed to be implemented with a systems-wide approach for sustainability (Barteit et al., 2019). Most respondents reported that their schools utilized free online resources and students used commonly available technology equipment (e.g., tablets, smart phone applications, etc.) to complete coursework, however this is not the case for all higher education institutions in Africa. Among higher education training institutions in Africa, only 38.5% note adequate access to e-learning platforms during the pandemic (Ossai and Ogbuoji, 2021). In terms of research and faculty, budget cuts and reallocation of research funding will lead to decreased diversification in research proposals and overall, less research by faculty in Africa (Ossai and Ogbuoji, 2021).

Finances were a common challenge of schools, which likely prevented investment in paid educational resources and equipment to support learning. Additionally, infrastructure can be a challenge, as was described by Walsh et al. (2018) in implementing e-learning in Liberia. When impelled to utilize online resources and technologies due to the pandemic, almost 80% of surveyed schools offered either partial or full course loads online. The COVID-19 pandemic has been reported to have caused an abrupt transition from in-person community-based learning to online delivery of course content (Goh and Sandars, 2020; McKimm et al., 2020).

The common postgraduate program specialties that were offered by schools in our study (i.e., surgery, obstetrics/gynecology, internal medicine, pediatrics, and occupational/public health) differed from those described by other authors. Talib et al. (2019) reviewed 813 publications from 2005 to 2016 on postgraduate training in SSA and found surgery, anesthesiology, emergency medicine, and family medicine specialties to be the most common. In addition to different specialties, over half of our respondents marked the answer option "none" in our list of specialties. Since many of the schools were established within the past decade, perhaps they had not yet established postgraduate programs. It is also possible that these schools have opted to focus on undergraduate medical training rather than postgraduate training.

These deeper understandings about curricular elements, accreditation, challenges, and innovations provide valuable insight to SSA medical schools. These findings could be used to strengthen current schools and plan effectively for schools that will train the next generation of medical professionals.

4.1 Limitations

This study had limitations. Despite considerable effort, we were able to obtain individually identifiable contact information for only 52 of the 130 medical schools so that the majority of the surveys were sent to generic addresses and websites. The intention of our strategy of sending the survey to all addressed was to obtain more responses - but most returned as undeliverable or did not get a response. This limiting factor artificially depressed the total response rate to 29% but counting responses sent to identifiable addresses the (likely more accurate) response rate was 56%. The range of developmental stages of new medical schools and their staffing shortages likely also contributed to the difficulty in finding reliable contacts; and the WFME site from which much of the list was compiled provided minimal identifiable contact information and mostly generic contact information.

We conducted the survey in English and therefore may have unintentionally excluded the Francophone schools of West African and Lusophone schools, especially from Mozambique and Angola where a considerable number of new medical schools have been in development. However, one school each from Mozambique and Francophone Cameroon responded to the survey.

We are unsure if the individual responding to the survey was the most appropriate person from the school to provide information. The accuracy of their responses could not be verified and may have resulted in some unreliable responses.

To maintain a reasonable survey length, we were not able to query schools on all components of their curriculum or school design. For example, we did not collect information on how laboratory practicals, aside from anatomy, were conducted.

4.2 Future directions

This survey is an important step in better understanding the status and needs of new medical schools in SSA. A more comprehensive study with greater representation of new schools and possibly with interviews of key school personnel should be conducted to learn more about trends, needs, and innovations in overcoming challenges in new medical schools. These schools are a gateway to the next generation of medical doctors in SSA.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

The studies involving humans were approved by Vanderbilt Institutional Review Board. The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study.

Author contributions

AR and QE designed the survey and collected data. KS and ER analyzed the data. KS, ER, and QE interpreted data and wrote the manuscript. All authors contributed equally to this study and approved the final manuscript.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Training in the art and science of facilitation to scale research mentor training in low and middle income countries

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Advancing biomedical research in low and middle income countries (LMICs) to expand the capacity for LMICs to integrate biomedical research into their health care systems and education has been the focus of many programs in global health over the past two decades. Central to the success of these programs is effective research mentoring, characterized by academic, career and psychosocial support through culturally appropriate practices. Research mentoring is a learned skill, developed through training, mutual discussions, practice and feedback. The majority of extant training programs are designed and delivered by US partners, so the next stage in building capacity is to train facilitators within the LMIC partner institutions to contextualize and advance mentoring specifically within their cultural and institutional norms by co-developing, delivering and evaluating semi-annual research mentoring training. To this end, we describe the development, delivery and outcome evaluation of a 5-week course in the art and skill of facilitation. Care was taken to explicitly distinguish between concepts of "teaching" and "facilitation," since "teaching" is closely connected to a transmission or banking model of education, which is characterized by "top-down," hierarchical relationship. The course discussed power and positionality, themes that resonate with partners in Nigeria and Tanzania. These themes provided unique entry into deeper conversations core to advancing mentoring practice away from the traditional dyadic power structure that remains from colonization. Evaluation findings indicate significant advances in awareness of differences between teaching and facilitating, increased confidence in facilitation skills, especially in the area of structured planning and organization, as well as improved communication and interpersonal skills. All respondents felt that students in Nigeria and Tanzania would respond well to the facilitation approach conveyed during the course and they found value in participating in the course as a cohort.

KEYWORDS

facilitation, mentoring, mentor training courses, low and mid income countries, equity and social justice

1 Introduction: background and rationale for the educational activity innovation

The successful advancement of biomedical research in low-and middle-income countries (LMICs) requires a combination of education, infrastructure, and opportunity that combine to develop both the research and professional skills of biomedical researchers (Heimburger et al., 2016; Zunt et al. 2016; Franzen and Chandler, 2017). For two decades, programs like Fogarty Global Health Program for Fellows and Scholars (Zunt et al., 2016) have built research capacity in LMICs, with a focus on training to advance a country's abilities to successfully address their health challenges, develop a cohort of local biomedical researchers, build infrastructure and implement a robust medical education system to self-sustain and grow (Potter and Brough, 2004; Cooke, 2005; Hargreaves et al., 2019; Lescano et al., 2019).

Professional skills such as mentoring, leadership, and communication, though generally considered less critical than research skills, are necessary supporting elements of research and academic success (Pfund et al., 2016), especially in academic training environments. Nurturing trainees who are engaged in local and collaborative research between LMICs and developed countries is critical to the success of the research and to trainee development. Mentorship builds capacity for research by facilitating the entry of developing researchers into the community of practice (National Academies of Sciences, Engineering, and Medicine, 2019), by harmonizing a mesh of experiences into common values and structures and thus provides institutional research growth and sustainability. The World Health Organization (Health research mentorship in low and middle-income countries (HERMES), 2022) has further reiterated research mentorship to be a powerful fundamental tool in science by not only leveraging recognized expertise to strengthen individual scientists and institutional capacity, but by helping to mold generations of researchers with positive influence on their career development by instilling a learning culture in research. Research mentorship is a core capacity in the process of generating research knowledge, communicating findings, and addressing important aspects of equity in health and education.

Effective research mentoring is characterized by academic, career and psychosocial support through culturally aware practices that further the careers of trainees and early career scientists (Pfund et al., 2016; Noormahomed et al., 2019; Womack et al., 2020; Byars-Winston et al., 2023). Mentoring is a learned skill, developed through training, mutual discussions, practice and feedback (Hokanson and Goldberg, 2018). Over the past decade, research mentor training has grown from an area of relative weakness (Cole et al., 2016) to an area which has demonstrated more widespread implementation, changing both practice and perspectives (Pfund et al., 2014; Gandhi et al., 2019; Hamer et al., 2019; Desai et al., 2021; Alidina et al., 2022; Sun, T., et al., 2023). Yet, mentorship in LMICs remains challenged by few training hubs and platforms, poor institutionalization, turnover and loss of expertise, and limited recognition and funding [Hansoti et al., 2019; Oppong et al., 2021; Health research mentorship in low and middle-income countries (HERMES), 2022].

In our own practice, we co-developed and co-implemented three, two-day research mentoring workshops in Nigeria and Tanzania, exploring multiple mentoring domains, and co-constructing a triad model with an indigenous mentor and a US-based mentor collaborating in support of a trainee. The workshops sought to shift mentoring practice and perspectives to trainee-focused, and away from supervisory roles. It is important to note that almost all mentoring training programs in LMICs, like ours, are exclusively developed and implemented by researchers from the U.S. (Rose et al., 2022;Deprez et al., 2023; Rose et al., 2023).

Mentor training in the U.S. has seen a large recent growth, due in part to a shift from a limited number of experts delivering workshops to scaling and implementing nationwide train-the-facilitator programs that directly address the most significant bottleneck to widespread mentoring practice, the lack of skilled facilitators (Pfund et al., 2017; Rogers et al., 2018; Spencer, 2018). These studies demonstrate the successful expansion and high fidelity of train-the-facilitator models. While training of facilitators to deliver local training is growing in access and implementation in the U.S., building this capacity in LMICs has not yet begun, and is an important need to support research capacity and academic advancement.

The art and science of facilitation requires both content knowledge and facilitation expertise. Facilitation is a learned skill and is different from teaching. Research on teaching practice has identified two broad categories, the transmission or banking model (Freire and Ramos, 1970) where the instructor is transferring their knowledge, generally through lecture, to the open vessel that is the student's mind, and student-centered teaching or social constructivism, where the instructor guides the student to engage in questioning, reflection, and discourse that allows them to build knowledge for themselves (Dewey, 1938; Light et al., 2009). While facilitation is akin to a learner-centered instruction practice, it has fundamental differences. First, teaching, especially in a biomedical academic setting, seeks to transition the student from a novice to expert by gaining a range of competencies in the subject. There is typically a well-defined set of abilities and knowledge that the expert attains, defined as "correct." Hence the instructor has a particular end goal in mind for the learner. Facilitation also guides the learner in constructing their own knowledge, but unlike teaching, intends the learner to contextualize and adapt the ideas, molding the content significantly to their own experience and needs. Facilitation's goal is not well-defined as in teaching, it is more the development of one's own perspectives and approaches that utilize effective, common structures, but do not necessarily reproduce them.

Training in facilitation, while different from training in teaching, supports instructors' advancement in both the workshop and classroom learning environments. This is especially true in low-and middle-income countries whose educational systems still reflect the vestiges of colonialism (Kay and Nystrom, 1971). Western educational systems were imposed, bringing with them a hierarchical, banking model of teaching that reflected the power and positionality of the oppressors, the occupying colonial power. While some systems have thrown off those bonds, many have not (Wandela and Eugenia, 2014). For example, while some institutions have now revised their curricula from knowledge-based to competency-based approaches, the guidance by instructors might remain a "church worship" one where only the preacher remains the speaker due to the accustomed system of education adopted from colonial mode. Colonial systems of education changed the pre-colonial era system of education from progressive to essentialist education to enable achievement of the goal of colonization (Garba, 2012). Consequently, this approach remained in the minds of people post-colonialism as thus the facilitative mentorship training has become necessary. Facilitation provides the opportunity to transform

from single, unidirectional mode in teaching to participatory mode where each key player has a chance to contribute his/her thoughts to the common goal. Teaching practice tends to reproduce transmission and lecturing, treating the students as receptacles of the instructor's expertise, rather than the creator of knowledge. Active learning and learner-centered instruction are not yet common in Nigeria and Tanzania (Bonwell and Eison, 1991), as they are frankly not yet common in the west (Freeman et al., 2014; Dancy et al., 2022; Handelsman et al., 2022). Hence our project needed to develop facilitation professional development for academic medical faculty that acknowledged where they were in their own instructional practice.

Based on a continuing clear need for research mentoring in low-and middle-income countries in the health profession, the clarity that research capacity building has focused largely on research skills and competencies, and the challenge of addressing the bottleneck of a lack of trained facilitators to lead local workshops, we designed, implemented and evaluated the effectiveness of a five-week, synchronous, virtual course on the art and practice of facilitation. We describe the pedagogical approach and frameworks, the workshop design and environment, and the post-workshop evaluation and interviews. As part of our process, we are including the experiences and voices of participants, applying an autoethnographic approach in describing the work (Ellis et al., 2010).

2 Pedagogical frameworks, principles, and innovations underlying the educational activity

The pedagogical framework for the facilitation workshop was to engage participants directly in the practice of facilitation through modeling, reflection and practice. Figure 1 displays the central process of the approach. This framework models approaches to guide rather than lead discussions to advance learner agency. The approach is based in part on large-scale facilitation training models (Pfund et al., 2017; Rogers et al., 2018; Spencer, 2018) around research mentor training with the addition of multipartial facilitation (Zappella, 2007; Giacomini and Schrage, 2009; Routenberg et al., 2013) and an intentional focus on power, privilege and positionality in local mentoring contexts. The lead trainer (Goldberg) would model facilitation multiple times during a workshop, each time engaging the trainees in a group learning activity, leading co-creation and group work, followed by reflection of both the learned content, and in a metacognitive dimension, discussing how the activity was facilitated and how a trainee would do so in their own context. Through modeling, the trainees could observe and experience multiple modes of facilitation; through practice, the trainees were able to translate to their own perspective and literally "do" the facilitation; and through reflection, both trainer and trainee were able to collectively capture key elements and build mental models.

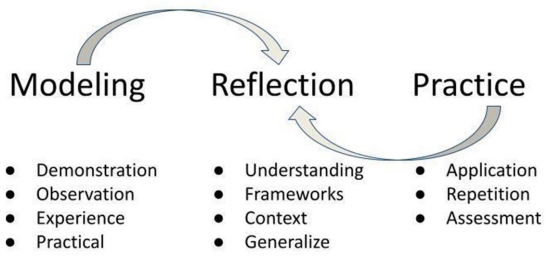

FIGURE 1
The pedagogical approach combined modeling with participant practice, coming together in reflection to develop learning and knowledge.

In addition, each day led with a core principle, that "we learn together." Specifically, that (1) we are here together in the same rooms to learn from each other. The wisdom is in the room; (2) we seek to explore new ideas, practice together, role play, in the process of developing facilitation skills; and (3) we are aware of and acknowledge the power and positionality differential, and seek that such differential is, when necessary, overcome to enhance learning.

Finally, many elements of the workshop focused on creating and sustaining learner agency, participation, and co-creation, all hallmarks of active learning strategies (Brame, 2016). These techniques were translated to the online format and were equally effective as in-person active learning approaches (Goldberg, et al., 2023). Examples include multiple breakout sessions with directed activities, specified roles (Brame, 2016), and group report; regular use of shared documents and creative spaces with Padlets, Google Docs, Jamboards, and chat streams; and pre-session and post-session asynchronous learning and engagement.

3 Learning environment, learning objectives, and pedagogical format

Due to the global COVID pandemic, the learning environment was an online format. Five 90-min sessions were held once per week between the beginning of August and early September, 2022. Pre-session materials included readings, reflection and an occasional video. Post-session included recap and reflection, completion of synchronous activities, and access to additional materials. This format was successful in balancing the time available and busy schedules of the participants - university faculty and administrators - with the ability to have some synchronous and asynchronous learning spaces.

The participants in the facilitation workshops were medical and nursing school faculty in clinical positions at Muhimbili University of Health and Allied Sciences (MUHAS), Dar es Salaam, Tanzania and the University of Abuja, Abuja, Nigeria. Four of the participants hold multiple titles, including that of Director or Dean at their respective schools. Most of the faculty are at a mid-career to senior level in their department, either as a lecturer and/or clinician and researcher. Nine participants have been teaching for 10 years or more. Eight of the faculty members were male and five were female. The participants were invited as part of two National Institutes of Health Fogarty D43 biomedical research capacity building projects, one at MUHAS focused on patient-centered research outcomes and one at the University of Abuja focused on cardiovascular research. Both cites had received prior research mentor training workshops, described above, and both sites sought to expand their capacity to lead their own research mentoring workshops.

The overall program learning goals were for participants in the series to

1. Describe the foundational elements of effective facilitation, the key features of active learning and high engagement, and apply the principles of backward design to create learner-centered content and experiences.
2. Develop and produce small group learning interactions; be able to describe the key steps and processes, identify facilitation challenges and opportunities, and support multiple interactions.
3. Identify appropriate areas of assessment and evaluation of effective facilitation and use these in an observation rubric; be able to produce and perform one's own designed small group learning interaction; be able to learn from peer-and expert evaluation.

Session 1: The learning objectives of session one were for learners to meet each other and build trust through asset declarations, reflect on their own expectations for the training, share their preconceptions of facilitation and the differences between facilitation and teaching, and co-created guidelines for discussion. The session introduced through modeling several key facilitation practices, including carefully directed breakouts with shared documents for collecting work product, and what should a facilitator first do when asked a question. This session built the foundation through presenting a social constructivist theory of learning and describing the three central modes of teaching and of learning (all session slides are included for reference in the Supplementary material).

Session 2: The learning objectives of session two were for learners to continue to develop strong, collaborative and supportive relationships, explore pre-session assigned work around active learning, collaborative learning and peer instruction, and delve deeply into power and positionality and culturally aware multipartial facilitation practices (Routenberg et al., 2013). Active learning exercises were followed by a focus on fundamentals of inclusive facilitation displayed in Figure 2. These discussions centered the ideas of power and positionality, and participants were able to identify different aspects of gender, age, career status, and ethnic groups that impact learning, and how multipartiality can identify majority narratives to highlight and make space for minority narratives.

Session 3: The learning objectives of session three were to recap power, positionality and mulitpartial facilitation to examine inclusive facilitation practices and explore examples, to begin the process of workshop and run-of-show design using basic backward design principles of Wiggins and McTighe (2005). Backward design was connected to Bloom's taxonomy, revised toward a cognitive framework (Anderson and Krathwohl, 2001) to emphasize the need for scaffolding the cognitive complexity of learning objectives and learning activities to reach deep learning goals. Participants began work on their own workshop design, and prior to sharing their ideas, engaged in a structured conversation about how to give effective, professional, and supportive feedback -- another key facilitation skill.

Session 4: The learning objectives of session four were to build out the backward design worksheet for their practice workshop, give and receive feedback in a structured mode, and examine the principles of a run-of-show design to guide the flow of the workshop. Participants shared their work and received structured feedback in small groups, followed by a meta cognitive reflection on the process itself and how it relates to facilitation. Key to facilitation success is a combination of content and pedagogy, which was particularly emphasized in this session.

Session 5: The learning objectives of session five were to explore and complete a run-of-show template See Supplementary materials, practice small-group facilitation, and consolidate the learning from the entire course through recap and reflection. In addition, as an action-reflection exercise, participants were asked questions about their own practice and described the spaces they were planning to use what they learned. Session five finished the run-of-show worksheets combined with the backward design workshop structure to provide participants with a complete sequence of developing an inclusive facilitation workshop on mentoring.

Completion certificates were awarded to participants who attended at least four of the five sessions. Twelve received certificates out of the initial 18 participants.

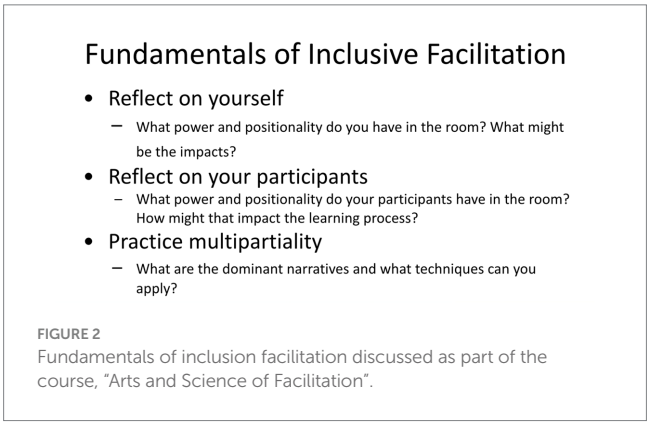

FIGURE 2
Fundamentals of inclusion facilitation discussed as part of the course, "Arts and Science of Facilitation".

4 Results and outcomes

The program was evaluated by an evaluation specialist from Northwestern University's Program Evaluation Core (2023). To guide the evaluation of this facilitation workshop series, we relied on the Kirkpatrick framework (Kirkpatrick, 1994, 1996) for evaluating training programs. Both in our post-workshop survey and one-on-one interviews, we focused mainly on measuring participant reaction to the training (level one of the framework) and the learning that took place as a result of the training (level two). Since we felt it was important to get immediate feedback from the participants, we only asked questions about *anticipated* changes in behavior (level three). We have not yet conducted a follow-up survey to measure the actual behavior change or the results of their changed behaviors (level four).

The goals for evaluation of the workshop series included:

1. Understand the extent to which and limitations of how the training engendered the participant's ability to engage, absorb, and build facilitation perspectives and skills.
2. Create a clear image of the participant's knowledge and skill gains, especially their own shifts in perspectives on teaching and facilitation.
3. Understand the change in participant's behaviors as a teacher and facilitator. Explore the potential impacts of participant's changed behaviors as a teacher and facilitator.

To holistically evaluate the workshop, we created a survey for participants to complete after the workshop series and an interview protocol. This mixed methods approach allowed for collection of quantitative, as well as qualitative data. Similar to many other

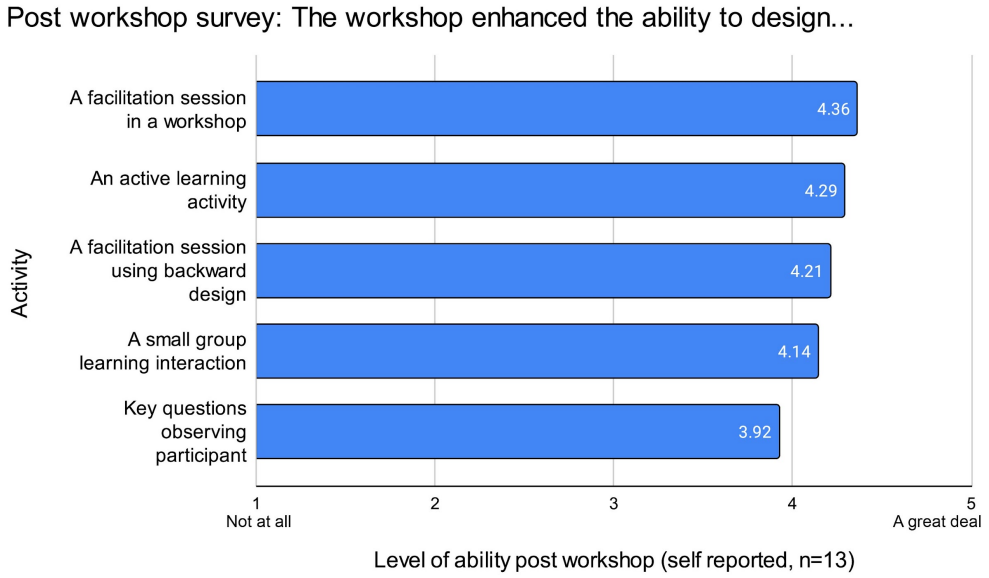

FIGURE 3
Post-workshop survey responses ($n = 13$) to the question. "On a scale of 1 to 5, where 1 is a little and 5 is a great deal, to what extent did the workshop enhance your abilities?" Note an overall high expression, with greatest enhancement of ability in facilitating a workshop.

post-training workshop surveys, this survey included questions about key outcomes relative to learning goals, described above. The survey questions were not validated as this study was a pilot and we did not have a large enough sample size to perform a validation study. Some of the questions from the survey were drawn from a validated survey. The survey included questions that required ranking on a Likert scale, as well as questions that solicited open-ended responses. A block of questions in the survey were drawn from The Critical Incident Questionnaire (CIQ; Brookfield, 1995, 2003), which is a tool for understanding classroom dynamics. Essentially, it allows the instructor to "see" the classroom through the perspective of the student (s). We chose to include this tool since it explores engagement as a proxy for learning within the activities of the workshop.

We did not seek IRB for this study because the study is considered to be an evaluation of an education program. Our institution's Institutional Review Board does not consider this to be Human Subjects Research as we are evaluating outcomes of a specific educational program and not seeking to generate generalizable knowledge that extends beyond this program.

The survey was sent electronically at the close of the workshop. Thirteen of the eighteen workshop participants completed the survey for a 72% response rate.

Five of the 18 workshop participants agreed to participate in the interview portion of the evaluation. The main goal of the interview was to understand the experience of the workshop participants in their own words and in a deeper way than the quantitative data provided.

5 Evaluation findings

5.1 Surveys

The post-workshop survey was completed by 13 of the workshop participants. Results of the qualitative section of the survey (see Supplementary materials) indicated that the structure of the workshop was key for learner engagement. The majority of respondents said they were most engaged during the small group breakout portions of the workshop. Reasons given for the high level of engagement included ability to share knowledge, experiences and ideas with peers, opportunity to think critically and being in a small group encouraged a higher level of engagement in the activities.

The facilitation practices that participants saw as the most influential takeaways from the training included: learner-centered methods, giving everyone a voice/chance to talk, listening/being comfortable with silence and understanding the role of the facilitator. Participants were also asked which practices they were most likely to employ as a result of the training. The top practices included: facilitating open group discussions by giving learners the opportunity to express their ideas and share experiences, facilitating small group work and using a backward design approach.

The quantitative section of the survey (survey reproduced in the Supplementary material) asked a series of questions that requested the respondent to choose a Likert scale rating (the scale rating choices ranged from 1 = none at all to 5 = a great deal). Mean scores for the questions below are reflected in Figure 3.

- To what extent did the training advance your ability to design a facilitation session in a workshop?
- To what extent did the training advance your ability to design an active learning activity?
- To what extent did the training advance your ability to design a facilitation session using backward design?
- To what extent did the training advance your ability to design a small group learning interaction?
- To what extent did the training advance your ability to design a list of key questions for observing participant interactions in groups?

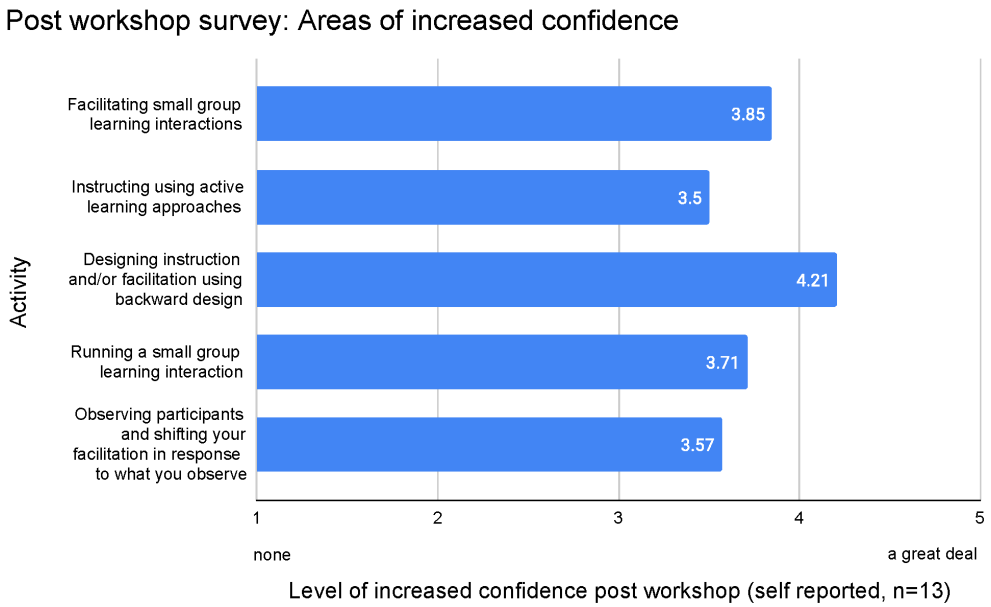

FIGURE 4
As indicated by post-workshop survey ($n = 13$) designing instruction and/or facilitation using backward design was the area of respondents reported the highest level of increased confidence.

The post-survey responses indicate the training most advanced participants' awareness of observing participant interactions in groups (mean 4.46, SD 0.63). The training also advanced participants' ability to design a facilitation session in a workshop (mean 4.36, SD 0.61). Furthermore, all participants reported a confidence gain of greater than 3.0 in all areas measured which included facilitating small group learning, instructing active learning, using backward design, observing learners and shifting approach based on observation (see Figure 3).

The results revealed that participants felt the training advanced their knowledge across a wide range of key design skills from asking key questions around observing participant interactions to using backward design to designing a facilitation workshop overall. See Figure 3.

The mean scores for the questions below are reflected in Figure 4.

- How much confidence have you gained in facilitating small group learning interactions?
- How much confidence have you gained in instructing using active learning approaches?
- How much confidence have you gained in designing instruction and/or facilitation using backward design?
- How much confidence have you gained in running a small group learning interactions?
- How much confidence have you gained in observing participants and shifting your facilitation in response to what you observe?

In terms of changes in confidence (Figure 4), we again observed large gains across the workshop learning goals, and in particular, confidence in designing instruction and/or facilitation using backward design, in alignment with enhanced ability. A notable area of significant increase was facilitating a small group learning interaction. The Likert scale used was 1 = none at all, 2 = a little, 3 = a moderate amount, 4 = a lot, 5 = a great deal.

5.2 Interviews

The interview protocol (see Supplementary materials) was built by the workshop facilitator and a team of two evaluators. Interview participants were asked about their levels of confidence, engagement and how they planned to use what they learned in the workshop. Five interviews took place over Zoom during fall 2022 about a month after the workshop sessions were complete. The interviews were audio recorded and transcribed. The same evaluation specialist facilitated the five interviews and took notes during each session and extracted themes from the interviews.

The interviewer created coding categories for each question and grouped the individual responses when they were similar in nature. For example, when asked the question, "Teaching means different things to different people, what does it mean to you?," the coding categories were (1) imparting knowledge (2) to evoke change, and (3) transmission of information and abilities. For that question, three participants used "imparting knowledge" in their responses, while one participant spoke of evoking change and one participant defined teaching as a transmission of information and abilities.

All five interview participants were all able to quickly articulate the commonalities and differences between teaching and facilitation. They were asked, "Teaching means different things to different people, what does it mean to you?," "What are the commonalities and differences between teaching and facilitation?" and "What are the commonalities and differences between facilitation and learning?" (The full interview protocol is available in the Supplementary material section). All respondents alluded to the fact that teaching and

facilitation both involve imparting knowledge. One participant described the following when asked the differences between teaching and facilitation:

> "Teaching is when someone is a novice, let them know some things, look at curriculum and deliver the knowledge. Facilitation is more active participation of the trainee, more interaction, gauge what they know and build upon that, increasing capacity to learn that thing."

One respondent described the relationship between teaching and facilitation as such:

> "Facilitation supports learning. Learning is a behavioral change that happens when facilitation is taking place."

All interviewees reported an increased confidence in and awareness of facilitation practices. Specifically, several respondents became more aware of facilitation as a two-way process between facilitator and trainee. Other respondents said they had been using some of the practices, but did not know the proper names. For many, the workshop clarified the difference between teaching and facilitation.

Interviewees were asked what particular skills they had gained during the workshop. Responses included organizational skills, like building an agenda, run of show, managing course content and backward mapping. Other respondents reported an increase in knowledge around how to interact with and engage learners during a workshop.

Although the workshop approach was based on and developed in Western models of higher education, all participants felt that the approach is easily adaptable for their cultural context.

> "Well, I think they're picking up because, um, the youth these days, you know, are actually more vocal. I know that. And sometimes they come in a class expecting you to just teach them, to give them information, but now that they know that they are supposed to come up with what they can do, what they should say. They should feel free to say things."

Workshop participants are planning to use their facilitation skills in a variety of contexts; in undergraduate classrooms, with medical school residents, in clinical training and during professional development workshops.

The training combined faculty from Tanzania and Nigeria. All participants reacted positively to learning with their peers from Nigeria and Tanzania when asked the question What was it like for you to work with faculty from Tanzania? (or Nigeria)? Several interviewees commented that teaching is universal, so the subject matter wasn't a barrier to interaction. In fact, the small group breakouts made that interaction much easier, as noted by one participant:

> "These things, you know, they are universal except that they are done different environments. So, it was not very difficult to start interacting as soon as we were split into groups. So, it was easier to initiate the discussion and then to everyone to contribute what or she or he knows and discuss and reach a conclusion, and then go back and forth and get feedback."

The small group discussions provided opportunity for feedback, which the participants highly valued. Overall, the group appreciated the different backgrounds and perspectives of their peers, which led to a more enriching experience in the workshops. The majority of respondents would have liked more workshop sessions or longer sessions and one interviewee felt that more participants in the workshop would have also added value.

6 Autoethnographic reflections

Autoethnography was used to capture participant experience and impact of the workshop. Autoethnography is a technique that asks participants to share as authors, describe in their own words their experiences, and thus bring forward a more direct and meaningful experience and deeper cultural meaning (Ellis et al., 2010). In the following sections, we include the direct words of three participants to challenge the sole reliance on traditional means of doing research that represents the voices and thoughts of others. In this way, we balance the quantitative and qualitative evaluation described above with direct descriptions of participants.

Deodatus Kakoko, Associate Professor of Public Health, Department of Behavioral Sciences, Director of Continuing Education and Professional Development, MUHAS, Tanzania.

I started reflecting on facilitation immediately in the first session as the facilitator set grounds by asserting that participants were in the same room to learn from each other and that the wisdom was in the room. To enhance this, dialogue and participation in the workshop was guided by some key aspects including stepping up, stepping back; speaking from personal experiences; challenging ideas not people as well as considering and acknowledging impact as well as intent.

One of the things to ever remember is the distinction between teaching and facilitation. It was interesting to learn the job of the facilitator as being to create conducive environment for learning and guide participants to learn and develop desirable skills. This a meaningful leaning where learners participate in creating knowledge using their lived experiences and it matched well with what I learnt in early days when I joined teaching profession as our tutors told us that "you must be a guide at the side, not a sage on the stage." Thus, introduction to facilitation skills activated my long stand understanding that learners are not "tabula-rasa" rather they have existing knowledge and experiences that can serve as a bridge to learning or acquisition of new knowledge. This corroborates the knowledge that facilitation is a step-wise process from "known to unknown" or "simple to complex." I gained new insight during the session on application of the principles of backward design to create learner-centered content that experience alone is not enough rather it is important for learners to reflect on their experiences.

Another useful part of the facilitation training was the learning community which I regarded as co-facilitation for co-learning. Although this was not a new concept at all in my teaching experience for more than three decades, but it was an eye-opener on how learners can be effectively engaged in the form of "peer learning." This is a very useful facilitation skill especially for public health postgraduate students who come for postgraduate education with vast experiences.

Knowledge and skills gained from the training are expected to be useful in the facilitation especially for undergraduate students. This is particularly in organizing group work for the students to reflect based

on their experiences as well as using the role plays for the student to practice learned skills. Acquired knowledge and skills are most important when it comes to organizing and conducting continuing education and Professional development short courses and workshops in the University. Acquired knowledge will also be used in facilitating community rotation field works for undergraduate students where they work in groups for the sake of field experiential learning. In that context, the approach of the learning community gained from the training will be used to make students learn from each other, brainstorm ideas, share and exchange ideas, and appreciate different perspectives.

Emmanuel Balandya, MD PhD, Department of Physiology and Director of Postgraduate Studies, MUHAS, Tanzania.

Reflecting on my experiences during the Facilitation Workshop, a few things come to mind. First is the amount of effort that an effective facilitator must put in during preparation for the session, all in the best interest of the learners. It was clear that an effective facilitator goes over and above what is required. This requires an exceptional level of dedication to excellence.

Secondly, an effective facilitator does not go into a session with preconceived ideas regarding how the session should go, but rather with the goal to free learners' minds and let their imaginations lead the way. To achieve this, an effective facilitator must be flexible to accommodate the unknowns.

To achieve learner-centeredness in the second point above, the facilitator must be effective at avoiding the center-stage. Various techniques can be utilized to achieve this, including assigning topics to learners in groups and letting them brainstorm, and thereafter discuss and present concepts. The facilitator may also use the technique of encouraging learners to dialogue among themselves rather than focus on the facilitator while presenting.

The fourth point pertains to the primary focus on the intended outcomes rather than processes. To achieve this, a facilitator begins by thinking about the outcomes of the session and walks backwards to devise methods and approaches, including innovations in case of challenges, to achieve the set outcomes through a process of "*backward design*."

An effective facilitator must also be prepared to deliver content effectively amidst differences in approaches to learning by the different members of the group. To achieve this, the facilitator must therefore be aware that the learners may have different goals and expectations of the learning experience at baseline. Bringing these to attention at the beginning of a session may help in refining and harmonizing the goals across learners, hence opening up the minds of those who went in with minimal expectations. The facilitator must also have the skills to identify quick learners and distribute them across groups with the goal to bring other members of the group to speed through "*peer-to-peer*" learning. In the digital era, the facilitator must also be conversant with the use of online tools to manage multiple groups at once. And lastly, the facilitator must be patient enough but also familiar with techniques to handle difficult personalities in the group.

The skills that I have acquired during the Facilitation Workshop are invaluable and I am putting them into good use not only in managing educational seminars with students, but also in managing research groups.

Rifkatu Reng MBBS, FMCP, FACE, University of Abuja, Abuja, Nigeria.

My learning experience has been in gaining skills in mentoring and facilitation on discussion or training on a basis of co-learning disposition, thereby giving room for knowledge sharing across a divergent group of learners. This allows the flow of different learning experiences in the group to be tapped. The ability to be comfortable with silence as a facilitator to give a chance and sense of belonging for a co-mutual and psychosocial support for a mentee or learner to attain set out goals in academics and research by guidance was highly impactful.

As a facilitator I have gained understanding in ensuring that learning should be taken from the basics to the complex knowledge, built around the participants work or experience. A purposeful activity on mentorship in my department has been initiated, and mentees have been paired with available mentors.

7 Practical implications, objectives, and lessons learned

Capacity building in LMICs in biomedical research requires capacity building in associated professional skills like mentoring, communications, and leadership. Yet the majority of programs focus on building those skills without building the capacity to teach those skills within a local context and without external partnerships. Hence, an essential stage in building capacity is to develop a cohort of trained facilitators within the LMIC partner institutions who can contextualize and advance mentoring training within their cultural and institutional norms. To this end, we developed, delivered and assessed the outcomes of a 5-week course in the art and skill of facilitation to address a critical gap in capacity building in research mentor training. A central component of the course centered the explicit distinction between concepts of teaching and facilitation, using it to shift practice to learner-centered education. The course was further based on a modeling-practice-reflection pedagogical framework, and modeled inclusive facilitation practice, active engagement, learner agency development, and learning community and community of practice structures.

The concepts of power and positionality were used to take an equity and social justice perspective, and were themes that resonated with partners in Nigeria and Tanzania. Discussion of power and positionality developed around gender, age, and ethnic social identities and explored how those impact learning from both the facilitator and participant perspective. Discussion addressed multiple ways a facilitator can create effective learning when differentiated identities create a structural imbalance in the learning environment. These included multipartial facilitation, structured small group learning, and intentional discussion guidelines.

Small group facilitation engaged participants, expanded their knowledge and provided the opportunity for them to share their experiences and to think critically. Facilitation practices of learner-centered methods, giving everyone a voice/chance to talk, listening/being comfortable with silence and understanding the role of the facilitator were key takeaways for participants. Participants reported that they would soon apply these skills by facilitating open group discussions and giving learners the opportunity to express their ideas and share experiences, as well as facilitating small group work and using a backward design approach.

Our lessons learned are encouraged by the positivity of our initial, post-workshop evaluation, distal interviews, and autoethnographic descriptions that highlight key facilitation values, skills, and practices.

Further, our delivery modality of a mix of asynchronous and online synchronous sessions was successful at developing perspectives and skills (Goldberg, B. B. et al., 2023). Based on the data from surveys, interviews and first-hand accounts, we are hopeful that the workshop will lead to institutionalization of effective professional skills facilitation as well as concomitant advances in learner-centered teaching practice.

Our model is replicable and adaptable to multiple LMIC settings. All that is required is a perspective shift from delivery of professional skills to capacity building in the training of professional skills and pedagogical expertise.

8 Conceptual and methodological constraints

The findings of this study need to be considered in light of several methodological limitations. We have a small, self-selected cohort of highly engaged participants from well-supported research capacity building programs in two large LMIC institutions in east and west Africa. Implementation of the program in a greater number of communities across a diversity of institutions would inform in a deeper way and provide valuable data on generalizability and scalability of the model. Our study also relies heavily on self-reported outcomes. A longitudinal study that observes participant skills directly and examines how participants implement mentor training within their local contexts and measures outcomes of those training sessions would provide more robust data on the efficacy of training and its longer-term impact. Such a study is currently in the planning phase.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Author contributions

BG: Conceptualization, Investigation, Methodology, Project administration, Resources, Supervision, Visualization, Writing – original draft, Writing – review & editing. EM: Conceptualization, Writing – original draft, Writing – review & editing. FK: Conceptualization, Supervision, Writing – original draft. SW: Formal analysis, Investigation, Methodology, Writing – original draft, Writing – review & editing. EB: Conceptualization, Writing – original draft. DD: Conceptualization, Writing – original draft, Writing – review & editing. RR: Conceptualization, Writing – review & editing. DK: Conceptualization, Writing – original draft, Writing – review & editing.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Supplementary material

The Supplementary material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/feduc.2023.1270480/full#supplementary-material

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International collaborative research, systems leadership and education: reflections from academic biomedical researchers in Africa

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Scope: Academic biomedical researchers and educators in African countries navigate complex local, national, and international systems to conduct grant-funded research. To secure funding, collaboration with researchers from high-income countries is often necessary. Existing literature highlights that these global health initiatives are commonly fraught with unequal power dynamics and lead by the foreign partners. Despite these inequalities, African faculty can benefit from these collaborations, fostering the development of their labs and careers. This study delves into reflections on lived experiences from academic biomedical researchers in Africa to better understand the impact of foreign collaborations.

Methods: We designed a qualitative study using the Interpretative Phenomenological Analysis (IPA) method and used Self-determination and Complex Systems Leadership theories to frame this study. Ten academic biomedical researchers in Africa consented to join this study. The participants submitted a four-week series of reflective journals through an online data management platform. Subsequently, IPA methods were employed to analyze the collected journals.

Results: Participants' reflections yielded six thematic key findings, encompassing their experiences in international collaborative research. The findings included: foreign dominance within the international macrosystem; resource challenges in their local microsystems; mesosystem dependency from collaborations; scholarly identity within research relationships; collaborative leadership; and the impact of the foreign perspective. From these findings, three implications were drawn suggesting that participants were (1) motivated by scholarly identity found in collaborations; (2) depended on collaborations that were colonialist but beneficial; and (3) created change through leadership at the microsystem level.

Implications: Foreign collaborators and funders in global health education and research should critically consider how implications of this study relate to their collaborative work. Based on our analysis, recommendations for foreign collaborators and funders include prioritizing local leadership and perspectives in education initiatives and research grants; reviewing and leveraging collective leadership; engaging in bidirectional training, and mentoring opportunities;

participating in power assessments; and removing publication barriers for researchers in Africa (and low-and middle-income countries). Insights from this study could impact global health research and education in multiple ways including new initiatives in mentorship and training in international collaborations along with increased awareness and correction of colonialism within these collaborations.

KEYWORDS

global health, systems leadership, research colonialism, power imbalance, capacity building, health system research in Africa and global south, grant management, Interpretative Phenomenological Analysis (IPA)

1 Introduction

Academic biomedical research in Africa, over the past three decades, has led to interventions and innovations that helped curb the epidemics of infectious diseases, including human immunodeficiency virus (HIV), tuberculosis, and malaria (Chu et al., 2014). Although the African region continues to have the highest prevalence of infectious diseases (Institute for Health Metrics and Evaluation, 2016), increased life expectancy has ushered in heightened rates of non-communicable diseases such as heart disease, diabetes, and cancers that generally present later in life (Airhihenbuwa et al., 2016). This double burden of infectious and non-communicable diseases presents a pressing need for further research capacity that will produce pioneering and sustainable healthcare solutions.

In response to calls to action for addressing this imbalance between disease burden and research, there has been a steady increase in interest to conduct research in Africa among researchers outside the continent, mostly from high-income countries in North America and Europe. However, such externally led research initiatives have not been without controversy, challenges, and ethical issues (Parker and Kingori, 2016). These challenges include unequal distribution of resources and work, power imbalances, misalignment with local research and disease priorities, and lack of local leadership (Parker and Kingori, 2016; Mlotshwa et al., 2017; Matenga et al., 2019). This phenomenon has been referred to by many terms but most commonly as scientific or research colonialism (Galtung, 1967; Jentsch and Pilley, 2003; Fennell and Arnot, 2008; Boshoff, 2009).

In research colonialism, foreign research partners propose the research agenda, which may not align with local priorities, and assume most of the credit for the research (Kok et al., 2017). The way in which research colonialism affects the researchers in African countries is to disempower and minimize local researchers in academia (Schneider and Maleka, 2018; Matenga et al., 2019). To mitigate research colonialism, many fundamental issues need to be addressed among which structural and funding systems are two major challenges African researchers encounter in leading health research (Kumwenda et al., 2017; Harsh et al., 2018; Nordling, 2018). Conducting research is often a complex interaction of institutional support, national infrastructure, international collaborations, and funding (Tulloch-Reid et al., 2018; Ezeh and Lu, 2019; Storeng et al., 2019). These issues at the micro-, meso-, and macro-system levels are often beyond the researchers' control but impact their research productivity and agency. A majority of global health research is controlled by bodies outside of the researched community (Shrum, 2005; Harsh et al., 2018) and power imbalances in international partnerships will exist as long as non-local researchers or institutions receive research funding as grant (Matenga et al., 2019).

In this context, training programs to increase academic biomedical capacity in low-and middle-income countries (LMICs), including those in Africa, have been proposed as a strategy to strengthen researchers' knowledge and skills as well as to reduce research colonialism (Kilmarx et al., 2018). Despite an abundance of training programs, there has been a lack of substantial reduction of research colonialism and negligible progress in research productivity among local researchers (Ezeh and Lu, 2019). Considering the noted barriers, building local administrative and grantsmanship capacity as well as teams of researchers and leaders have been proposed recently as a solution (Tulloch-Reid et al., 2018). However, there is still a scarcity in the academic literature to support this potential solution.

Apart from training needs, advocates for research equity vouch for local researchers' strong leadership of research projects (Airhihenbuwa et al., 2016). There has been an increased awareness of the need for research collaborations in Africa to be led by those within the community or country of focus. Airhihenbuwa et al. (2016) have encouraged researchers in LMICs to "claim your space" (p. 21S) in the research landscape. Frustratingly, only 10% of worldwide health research and development funding is spent in LMICs where over 90% of the world's preventable diseases occur, a paradox known as the "10/90 gap" (Kilama, 2009). This inequality might explain why local researchers lack substantial roles in research leadership and representation in authorship.

After surveying African researchers, Ager and Zarowsky (2015) concluded that these researchers had difficulties establishing authority over research and funding priorities since much of the research funding in Africa originated in high-income countries. Research methods and priorities typically have aligned with scientific and cultural traditions from the funder country, rather than where the research is conducted, which has led to research projects that have neglected local health needs (Jentsch and Pilley, 2003; Vasquez et al., 2013; Munung et al., 2017; Matenga et al., 2019). Collaborations between local researchers and foreign partners should include a shared research agenda driven and led by the local researcher (Seo et al., 2020). Local coordination and leadership of projects, priority setting, and authorship as well as a plan for long-term sustainable collaboration have been shown to contribute to effective international partnerships (Chu et al., 2014).

To plan for effective international research collaboration, a comprehensive understanding of the institutional, national, and international challenges encountered by African researchers in grant development, leadership, and their scholarly identity is crucial. In pursuit of this understanding, we conducted an interpretive phenomenological analysis (IPA) study among African academic biomedical researchers who participated in a training program focused on grant writing and research ethics at a university in the United States of America (USA). We aimed to explore their reflections of their lived experiences in writing and leading research grants with foreign collaborators. The research questions guiding our study were: How do African academic biomedical researchers, navigating the constraints of a culture of research colonialism, interpret their international grant collaborations at the individual, organizational, and international levels? How have these experiences influenced their individual scholarly identity?

2 Methods

2.1 Theoretical frameworks

In this study, two major theories were employed as analytical frameworks: Self-determination Theory and Complex Systems Leadership Theory.

Self-determination theory provided a framework to examine intrinsic and extrinsic motivations that guided participants' perseverance and behaviors. According to theorists, growth is spurred by positive motivations, but stagnation may occur if psychological needs, which include autonomy, competence, and relatedness, are not met (Ryan and Deci, 2000). We proposed that these three elements would be integral parts of participants' experiences: autonomy in guiding their academic research; competence from skill building in a training program (from which the participant pool was selected); and relatedness in collaborations. However, due to challenges described in the literature, we hypothesized that participants would experience these elements to varying degrees, which according to the theory, could hinder motivation, perseverance, and growth.

Complex Systems Leadership Theory served as a framework to understand how networks of individuals within systems interact to overcome challenges (Hazy et al., 2007). Organizations, conceptualized as living organisms, consistently encounter internal and external challenges and adapt to survive (Weberg, 2012). When faced with such challenges, leadership emerges as individuals across organizational levels and boundaries interact and link together to discover adaptive solutions (Hazy et al., 2007). These interactions lead to the emergence of new, superior behavior patterns, and successful, adaptive behaviors are internalized. Informal leaders often arise within these interactions to guide the group toward new norms. This framework was chosen to shed light on how participants potentially assume leadership roles within the intricate, complex networks of institutions and partners involved in international collaborative research.

2.2 Study design

To explore the research questions, we used IPA methods to collected and analyze qualitative data. IPA provides tools for engaging deeply with participants about a particular experience (Smith et al., 2009). In IPA methods, after collecting participants' experiences of a phenomenon, researchers interpret participants' perceptions (Smith and Osborn, 2008) to understand how they make sense of the experience. We gathered participants' perspectives on collaborative research experiences through one-on-one engagement, facilitated by written journal entries.

Fifty African academic biomedical researchers from Ghana, Mozambique, Nigeria, Tanzania, and Zambia who completed a grant writing training program at Vanderbilt University in the USA were invited to participate. This program was chosen because it is the only known USA-based program that trains academic biomedical researchers from LMICs in grant writing so they can establish their authority and leadership as principal investigators on internationally funded research grants (Cassell et al., 2022). Most of the program's trainees are in Africa and collaborate with researchers at Vanderbilt. Inclusion criteria for study participants were: From an African country; Currently or previously engaged in foreign grant-supported academic biomedical research collaborations for at least 2 years; Hold a degree in a health-related field (e.g., MBBS, MBChB, MD, PhD); Be able to use a web-based research instrument; Be able to write responses in English; and Be an alum of the aforementioned training program. Ten researchers consented to participate and submitted a four-week series of reflective journals.

2.3 Data collection

We used a constructivist epistemology perspective, which views reality as constructed by individuals. Since people's perceptions of an event or item provide its reality, participant journals were selected as the data collection tool to capture individual experiences. We selected this format to increase distance between the participants and research team in order to minimize power imbalances and influence (Morrell-Scott, 2018). Ten individuals consented to participate and submitted journal entries, which is the highest of the general sample range (four to ten participants) suggested for IPA studies (Smith et al., 2009). IPA research is idiographic and focuses on detailed examinations of individuals' lived experiences. Our sample size provided the ability to gather rich descriptions of participants' experiences and conduct in-depth examinations of those experiences.

We obtained ethics (IRB) approval for this study prior to contacting potential participants. We emailed individuals a link to a consent letter with information about the study, including assurance of confidentiality in their responses. After providing consent to participate, they received a series of four reflective journal prompts, each with a main question and sub-questions that were informed by the study's research questions. We instructed participants to write one journal entry of 500–1,500 words for each of the four prompts. They could respond to one each week or respond at more frequent intervals as their time permitted. This flexible format provided participants an opportunity to guide the research, which is an element of IPA, as well as sufficient time to reflect on topics. After submitting their entries, participants were asked to complete a demographic survey that queried on their country, gender, years in collaborative research, and areas of research expertise. All information was submitted electronically and anonymously using REDCap (Harris et al., 2009, 2019), a secure online data management platform.

TABLE 1 Demographics and attributes of participants ($n = 10$).

Category	*N* (%)
Country	
Ghana	1 (10%)
Mozambique	1 (10%)
Nigeria	3 (30%)
Zambia	4 (40%)
Did not disclose	1 (10%)
Gender	
Female	3 (30%)
Male	6 (60%)
Did not disclose	1 (10%)
Years in international research	
2	2 (20%)
3	1 (10%)
4	1 (10%)
5	3 (30%)
7	1 (10%)
12	1 (10%)
15	1 (10%)
Research area (many participants wrote multiple areas, hence total is greater than 10)	
Cardiovascular science	1
Epidemiology	2
Health equity	1
Health systems	2
Hematology	1
HIV/AIDS	1
Implementation science	1
Infectious diseases	1
Maternal health	1
Microbiology	1
Pharmacology	1
Primary care	1
Sickle cell disease	2
Did not disclose	2

2.4 Data analysis

For each participant's set of journals, one researcher conducted multiple readings, interpreting, and coding of the writings in NVivo 12 software (QSR International, Melbourne, Australia) before proceeding to the next participant's journal set. The coding process involved applying concepts from the theoretical frameworks and relevant academic literature on the topic, as described earlier. Following close readings and interpretation, we organized codes into themes, derived from the research questions and frameworks, as well as areas of convergence and divergence in experiences across participants.

3 Results and findings

Participants were located in four African countries, Ghana, Mozambique, Nigeria, and Zambia (however, one participant did not disclose their country, so a fifth country may have been represented) (Table 1). There were three females, six males, and one individual who did not disclose their gender. Participants reported being involved in collaborative research with foreign partners for an average of 6 years (range: 2–15; mode: 5). Six thematic findings emerged from their reflections: foreign dominance within the international macrosystems, resource challenges in their local and microsystems, dependency on collaborations creating a mesosystem, their scholarly identity within research relationships, collaborative leadership in local teams, and the impact of the foreign perspective (Table 2).

3.1 Finding 1—macrosystem: foreign dominance

Internationally, participants encountered power imbalances and foreign dominance throughout the grant process. In the participants' reflections, it was evident that power inequities were present from the beginning of the grant process. Grant topics often came from foreign funders and collaborators. Topics were often not aligned with local needs, prompting participants to adjust their research areas. These power dynamics continued to be described in grant writing and submission, foreign leadership dominance during the grant, and publishing results in international journals. However, participants also reflected on mutual benefits in these relationships and wrote about the importance of collaboration. With such juxtaposition, it was often hard to interpret underlying meaning in participants' experiences.

Participants described power inequities, beginning with research topics and collaborations requested by grant funders but not aligned with local needs. **Participant 9** explained how their local research topics were influenced by foreign funding, and how s/he and other researchers had to tailor their research areas to fit that funding agenda. S/He described,

> "*The research agenda here, like in many other African countries, is guided by external funders. Thus, one has to keep responding to external calls for proposals. The last decade was largely taken by HIV/AIDS research. There was minimal interest in non-HIV research. Most of us had to find some niche within the HIV arena to keep relevant. This made those of us in basic sciences deviate from our primary career goals.*"

Furthermore, international collaborations were often required by the funder, restricting the local researcher from directly applying for a grant. For example, **Participant 7** wrote that s/he "*decided to collaborate with an international partner because it was a grant requirement that researchers from resource-limited countries should partner with researchers from developed countries*." Likewise, **Participant 3** "*could not have qualified for the application unless I had a global (US-based) mentor.*"

Foreign dominance was also described in writing collaborative grant proposals. Some participants described a "*need for more collaboration on grant writing and submission*" while other jointly wrote proposals in which "*each member participated in writing sections*

TABLE 2 Findings with exemplar quotes from participants.

Findings	Exemplar quotes from participants
Macrosystem: foreign dominance	• The decision to apply was at the instance of the [foreign institution] team. (Participant 4) • This makes us remain as sub-awardees sometimes to grants that are targeted at Africa and reduce access to funds in that the prime [i.e., foreign institution] takes a larger portion of the funds (Participant 9) • The collaboration was mutually beneficial considering that our international partners have access and skills needed to acquire the funding, while we can support the project with efficient recruitment. We needed each other to answer, convincingly, the research question we have. (Participant 3)
Microsystem: local challenges	• Another huge challenge is creating time to write. Our academic system does not give 'protected time' for research especially for junior faculty thereby, limiting their ability to generate preliminary data for applying for grants. Therefore, for any sort of academic writing, we had to bend over backwards! (Participant 5) • You could imagine spending more than your monthly earnings to publish in a good journal. Definitely, you cannot publish much due to the cost. Sadly, the local journals that are affordable have no rating and many of them are not indexed. (Participant 3)
Mesosystem: dependence	• To overcome this, I reached out to my old colleagues and tried to conduct research and get these published. (Participant 6)
Scholarly identity	• Collaborative research has also strengthened the other members of the team to the extent that the skills we gained has made us stand out in our institution and a number of collaborators have reached out to us on the conduct of some studies. (Participant 5) • Though I came into research kind of by accident, I have remained in it because it provides an avenue to participate in generating evidence for health. As I practice medicine, I see how research changes practices and stimulates more questions. The recognition that comes with being part of impactful research is great but also the lessons and further questions that arise from negative studies are important for further research. (Participant 10)
Leadership	• There were times when challenges on patient management were brought to the forum and such issues would be discussed thoroughly until a general consensus was met. Decisions are often taken collectively with the guidance from both the protocol and the local ethics. (Participant 5)
Foreign perspective	• The most challenging thing about this experience was the terms and conditions for this collaboration, around data sharing and payment for the national team members, considering that an amount of work will be done in the country. I have learned that aspects of data sharing, authorship and financial aspects are very important and to be discussed upfront. (Participant 2) • There was also some level of negotiation within the organizational structure to clarify what my colleagues expected my role to be. It seems that the structure would have duplicate leadership roles so that it required documentation of what my roles were so that we knew what to expect. (Participant 10)

of it," (**Participants 1 and 7**, respectively). However, **Participant 9** described a few different experiences in establishing foreign collaborations and the grant submission process,

> *"I have been engaged in several international projects which have had different approaches to the partnerships. There have been projects where we have drafted the concepts together and refined the concepts and crafted the methodologies together. In these projects we have had a common understanding and set common activities which have been costed for the budgets. These have been the most equitable collaborations… The resources have been shared equitably and I have held a subaward agreement. In those collaborations which have required a third world leadership, I have been the prime recipient with my international collaborators holding subawards. However, there have been some research projects which have been brought to us in Africa as comparative studies having been fully developed in the west. In these, we have had to conform to the dictates of the methodologies already worked out. However, we still have had the opportunity to refine the costing of the activities for the budget and have been allowed to pilot and sometimes vary the budgeting to allow for the local nuances."*

Her/His experiences demonstrated variation in research collaborations, which was found across participants. This variation, especially within one section of a journal entry, presented challenges in interpreting experiences. Phrases of this excerpt were coded as effective collaboration as well as research colonialism and represent the complexities in these collaborations.

There was an imbalance of leadership at the macro-level. **Participant 2** noted that "*It is also important to balance the power between the national and international collaborators on a research project, including opportunity for leadership roles*." **Participant 4** desired greater leadership, "*While we are glad with the current state of collaboration with non-in-country collaborators, I would be glad to play more senior roles such as Multi-PI status*." Additionally, participants wrote about the leadership related to budgetary power that foreign partners held. **Participant 10** noted, "*budget lead is not possible for local leadership*." S/He further explained that "*if we as a group decide to take up such research then all the final budget decisions are made in the international office*," not locally where the research is being conducted as one might expect.

Participants also described that researchers from LMICs encounter negative bias from international journals that are predominantly located in high-income countries. **Participant 3** explained that,

> *"The good journals are not immune to some bias and prejudices. You are automatically disadvantaged if you are writing from a low-income country with no pedigree for good research. You need to be extraordinarily patient, because you will get a lot of automatic*

> *rejections from good journals. This is mostly because someone somewhere assumes that nothing good will come out of such a place that has no pedigree, particularly if the work is not associated with renowned partners in Europe and America. It is certainly hard for a young academic, but it is a reality he or she must face while growing up."*

Regarding co-authorship with foreign partners, participants wrote about opportunities to publish with their foreign collaborators. Further describing these experiences, **Participant 9** reflected that "*some collaborations have required prior signed agreements while in some we have had to agree on these on an ad-hoc basis*" and that they "*advance on the principles of getting full appreciation of the activity and getting the most appropriate representative to take leadership*."

Despite power imbalances and challenges, about half of the participants used positive words and phrases when writing about international collaborations. They described their experiences as "*a healthy one*" **(Participant 1)**, "*amazing*" **(Participant 3)**, "*interesting*" **(Participant 5)**, "*exceptional*" **(Participant 9)**, and "*good*" **(Participant 6)**. **Participants 3 and 9**, respectively, wrote, "*There is nothing I would have wished to change in my experience of working with my international partners*" and "*In all, my experiences have been quite positive and I've enjoyed every moment of my engagement on international collaborative research projects.*" Furthermore, participants wrote that these research relationships were "*mutually beneficial*" and "*helped achieve results faster and better*" because of the "*wider skills and vast array of resources available for the project*" (**Participants 3, 1, and 9**, respectively).

3.2 Finding 2—microsystem: local challenges

All participants, regardless of their number of years in research or their position, reflected on experiences of institutional and national resource challenges within their microsystem. These challenges were often complex and multi-faceted. In establishing a research career, participants faced obstacles related to time, infrastructure, funding, and mentorship. Participants wrote about the ways that these resource limitations hindered their research productivity and hence, their scholarly growth and professional autonomy. However, in their reflections about these challenges, they demonstrated resiliency. To overcome these challenges, participants described turning to foreign collaborations to fund their research, obtain resources, and find mentorship.

Having adequate time to conduct research activities was a major challenge to many participants. **Participant 2** reflected, "*it was hard to dedicate time and resources to a research career*" because "*we have to work in multiple settings, in order to make ends meet… it was quite difficult to dedicate time to research.*" For example, **Participant 1** explained, "*clinical work is so voluminous that it eats into the time left for research*" but that participant *"tried to overcome this."* The lack of time often resulted in "*some activities or assignments were not completed as quickly as was expected by other international colleagues*" (**Participant 5**). However, experiences with foreign collaborators gave her confidence to negotiate with her institution for protected research time,

> *"Experience from these collaborations has given me more confidence in my academic writing and also in negotiating with my employers, especially with regards to protected time for conducting research, which in most low-and middle-income countries is very difficult to get."*

Regarding the local systems, almost all participants wrote about a lack of funding for research, salaries, and journal publication fees. **Participant 1** reflected, "*after overcoming time constraints, is the challenge of funding for research activities.*" **Participant 3** described the "*disturbing*" reality that "*researchers rarely find any funding support from the government or non-governmental organizations*" in their countries. Continuing, s/he added that "*the salary is very low compared to practitioners who chose to work outside the academic circle.*" **Participant 7** attempted to explain the funding situation and research implications: "*institutions in African settings have little stimulus packages to motivate development of research studies locally*" resulting in "*the full spectrum of ideas one would want to explore has to be limited for cost considerations. This approach affects the quality of research and limits the creativity expected from a researcher.*" S/He described "*overcoming these challenges through doing basic research that does not require huge resources and by collaborating with international institutions.*"

Participants also used personal funds to pay for manuscript publication fees but that "*greatly affected the caliber of journals… because some were too expensive*" **(Participant 5)**. **Participant 2** noted, "*publication fees are sometimes too high*," which was exemplified by **Participant 3** as "*higher than the average monthly earning of an academic from our country.*" To address this challenge, some participants requested for waivers from high impact journals, highlighted by **Participant 6**: "*we cannot arrange the money as this particular study was an unfunded activity and we did it because of our scientific rigor and for the overall benefit of TB/HIV prevention in* [country]."

Funding also affected **Participant 2**'s ability to pursue research training because s/he "*could not afford paying online course fees.*" S/He also wrote about the high fees for "*participating in scientific conferences*" and has found that "*moving to a research institution allowed me to have access to some (few) training tools.*"

Several participants noted challenges related to infrastructure as they worked to conduct research independently and with foreign teams. **Participant 9** described, "*the largest handicap I face is no official Grants Office at my institution.*" **Participant 7** also noted the need for the "*strengthening of the grant office.*" Additionally, he wrote that "*institutional ethics committees are not streamlined in most resource-limited countries*," which was further described by **Participant 2** as "*very bureaucratic processes in the country for study approval by an IRB that can take almost a year.*"

A "*big barrier*" that many participants faced was a "*lack of academic mentorship*" (**Participants 2 and 5**, respectively). As described by **Participant 5**, "*until very recently, this was the norm in most* [country] *institutions*" and s/he "*never had anyone mentor me on academic writing until I went for the* [foreign training program]." This lack could be explained by **Participant 7**'s observation that "*This guidance is largely missing in African settings due to insufficient mentors.*" **Participant 2** explained that, like the participants, "*Mentors and supervisors are themselves involved in multiple tasks and activities that little time is left for mentorship. It may take months to receive the feedback from a work submitted to them for review*," thus delaying research and academic progress.

Some participants sought guidance from foreign mentors and collaborators, while other participants developed workshops and programs to build a pipeline of local mentors. For example, **Participant 4** recently submitted a grant application to develop and provide "short-and *medium-term learning opportunities, paired mentoring arrangements and seed funds to eligible mentor-mentee teams*" to "*create the next generation*" of clinical researchers.

3.3 Finding 3—mesosystem: dependency

Many participants overcame local challenges through foreign collaborations that provided funding. Their descriptions revealed dependence as they relied on requests for collaboration that would provide research funding and other resources that were needed to move research projects forward. Through this dependence, they created a mesosystem that between the local microsystem and international macrosystem.

Participant 6 reflected, "*I believe if we want to excel in research then we have to establish foreign collaborations. This is particularly true for researchers from developing countries*." For some, collaborations filled a technical gap, as described by **Participant 9**, "*The proposal required a complement of technical expertise, which was inadequate at my institution*." **Participant 5** attributed success to "*collaboration with people outside my country that have the experience of writing successful grants and mentoring.*"

Participants depended on their collaborators to send information about grant opportunities: "*publicity of these calls for proposals was done only to exclusive audiences and thus we had to depend on our colleagues in the west to see them and send them to us*" (**Participant 9**). Due to such dependence, **Participant 9** commented, "*I have not established an independent research career and I do not think I ever will*," despite having co-led multiple grants.

Participant 9 explained that s/he looks abroad for funding because there is "*very little local funding for research which makes it difficult to pursue local research priorities thus keeping our eyes focused more on global health research*." Similarly, to overcome local funding challenges, **Participant 5** described, "*I made up my mind to start writing grants so that I can access some of these funds to conduct research in* [home country]*, where there is so much to do and no resources*." Using foreign collaborations to fill gaps in infrastructure and expertise was "*necessitated*" (**Participant 7**) to continue their research. **Participant 10** wrote that in working with an international group, "*we have established a research office in my country*," which "*has helped me remain in research*." Similarly, **Participant 3** described funding research through foreign collaborations,

> *"The opportunity I got from working with international mentors paved the way for me to understand how to access extramural grants and fellowships from international organizations to support my modest research ideas. This is one of the biggest motivators."*

However, in seeking international funding, **Participant 9** worked to move away from dependence by strengthening capacity within his institution so that they could bring equity to research by leading grants rather than being dependent on foreign leadership. S/He described,

> *"I have tried to minimize these disadvantages by training a grants management team which would understand research compliance processes and be linked into the research information systems so as to adequately advise on any calls* [for grant proposals] *being planned for and also on identifying appropriate partners. As we build this capacity, we prepare ourselves to prime* [i.e., submit] *on some of the grants and invite our partners to collaborate. This gives a sense of equity in the research arena."*

3.4 Finding 4—scholarly identity

In their reflections, participants described relatedness within collaborations during impactful experiences in foreign training programs and through ongoing mentorship. In foreign collaborations and trainings, participants experienced recognition as a scholar, especially when they published and presented their research. Interpreting these reflections, the experiences motivated them and enhanced their confidence and identity as an international researcher. In addition to this extrinsic motivation to research, participants expressed intrinsic motivations. They reflected on how their research had the potential to and did generate evidence for policy change to improve health outcomes.

The scholarly and career impacts of formal training experiences were central points of reflection for some participants. **Participant 5** described, "*during this period* [of grant writing training in the USA]*, I was introduced to 'proper' academic writing… by the end of* [training program]*, my first manuscript as a lead author in a high-impact journal was almost ready for submission!*" In a similar vein, **Participant 2** reflected on "*having not much experience in grant writing and submission*" and noted that "*recent experience in* [grant writing training program] *was very important for my research career*."

Reflections of skill development, increased competency in grantsmanship, and career growth were interwoven with descriptions of collaborations and mentorship. **Participant 7** summarized, the "*research career path development requires guidance from those who are established*," highlighting the impact of mentorship in research and professional development. Diving deeper, **Participant 6** described mentorship as a formative process, "*During this whole process I was not spoon fed. I was guided, made to think, provided literature that I had missed so that I could develop the research proposal myself, but under the supervision of my mentors*."

Several participants described joint publications with their international mentors as well as the formation they received in the process. **Participant 5** described,

> *"At this point in my academic career, I am glad to say that my international collaborations have changed my outlook to academic writing completely. I have leveraged on the knowledge I have gained and improved on my academic writing, now I am better placed to develop and submit quality academic writing with the support of my mentor."*

Participants also described publishing as lead author with their mentors including, they "*gave me the opportunity to be the lead author in that publication*" (**Participant 5**) and "*I have had equal opportunity*

to be first author on some of the publications from collaborative works" (**Participant 9**).

Some participants explained that publishing and researching to generate evidence for change motivated them. **Participant 1** was encouraged by "*seeing the results of our research published in academic journals and being cited*." Others found scholarly identity in the recognition that came with publication. After **Participant 3** experienced her/his "*first breakthrough of publishing in an international journal through that collaboration*," s/he described receiving "*visibility in the sense that now some of the international journals send articles for me to review*." Additionally, s/he expressed pride in being asked by a foreign collaborator to partner on a new grant, describing it as,

> *"After delivering the first project successfully, my collaborators appreciated my methods of managing our local team. This fetched me another collaborative project with them. My team maintained a similar approach. We worked harder and brought on our experience of the previous work to bear."*

In that and other ways, participants described becoming more confident in their scholarly identity through foreign collaborations. **Participant 9** explained, "*This interaction with other scientists in different jurisdictions is very satisfying to a researcher and gives one a sense of self-worth that is incomparable*." Additionally, **Participant 10** described that foreign collaborations led to "*recognition within the country for contribution to the field*" as well as "*recognition in country and internationally so that research groups have approached me as an individual to conduct their research*."

However, participants' scholarly identity was not simply defined and motivated by extrinsic recognition. They described intrinsic motivation to pursue scientific discovery that would change policies and improve health outcomes. As **Participant 10** described,

> *"Though I came into research kind of by accident I have remained in it because it provides an avenue to participate in generating evidence for health. As I practice medicine, I see how research changes practices and stimulates more questions. The recognition that comes with being part of impactful research is great but also the lessons and further questions that arise from negative studies is important for further research."*

Through their research, participants engaged with local government and hospital leaders. **Participant 9** reflected, "*the linkage of research with civil society work has been an exciting side*." Participating in these conversations "*provided a wider platform from which to disseminate the research findings to an audience that is keen for knowledge translation mostly aimed at evidence-based policy formulation and/or implementation*." **Participant 5** worked with "*the government to key into our program to ensure sustainability of the project*." S/He further described how one of her grant-funded studies "*completely changed the management of children with sickle cell disease… in our hospital and state as a whole*."

3.5 Finding 5—leadership

Participants were leaders within their local institutional teams. They described leadership with emphasis on the group's well-being and collective decision-making. However, their reflections revealed a disparity in leadership dynamics while collaborating with their foreign partners. While actively contributing to the team, participants perceived a lack of leadership in the international macrosystem and expressed a desire for more substantial leadership roles and recognition.

Participants overwhelmingly described leadership as a group effort, summarized concisely by **Participant 10**: "*obviously leadership is seen in ability to function in a team*." In describing their leadership, many participants wrote about regular, "*weekly and sometimes fortnightly*" team meetings in which "*from conception to execution, decisions were taken collectively*" (**Participants 1 and 3**, respectively). In general, participants noted that decisions "*are taken collectively*" and "*were made by discussions with the whole team*" (**Participants 5 and 1**, respectively).

In leading local teams, **Participant 3** "*made them understand the project is not all about me. It is about all of us, and nothing should stop because I or any one of us is not around*." In this fashion, weekly team meetings, which were initiated "*to make everybody feel onboard… including the coordinators*," continued to occur "*even when I traveled*." Furthermore, decisions to accept a project proposal were taken together because "*whether we should go ahead or decline is based on our collective interest, not my interest alone*." Similarly, **Participant 5** described, "*I will always bring issues to the table for discussion and I hear everybody's suggestion. We critically discuss and analyze all the suggestions and I eventually use what I have learnt from the team to make the final decision*."

Participant 10 described leading the local team as "*decisions would be made centrally but it was expected that as a local leader, customizing for the local context was up to the leader.*" However, s/he described challenges with being recognized as a leader in collaborative grants, further explaining,

> *"Another critical role is to act at the interface of the organization and external stakeholders. Through the years, the duplication of leadership roles I believe is a challenge that one working in collaborative research environments needs to be aware of. It becomes easier to negotiate with higher responsibility but there seems to be someone else trying to do your job."*

Explaining his experiences further, **Participant 10** described,

> *"I am included as an investigator in many grants that come in but not necessarily pushed to do on my own… What I have noted in these positions, due to the need to have a link with universities abroad there is always a feeling that I am not really the lead. Obviously, leadership is seen in the ability to function in a team but the dual structure of the local office and the abroad structure make it difficult to lead, particularly team members who seem to answer only to the abroad component of the structure."*

However, s/he later noted that, "*With time, my role evolved with taking up roles of investigator and my leadership role also became more 'real'*."

Most participants also described leading only at the local level, although they still experienced a collaborative effort within the larger foreign team. **Participant 4** explained, "I have been on the know from drafting the grant application through submission and subsequent

award. I am comfortable with the level of transparency and collaborations."

Similarly, **Participant 7** described collaboration as well as his input on team discussions,

> *"Most decisions were made during the meeting times. We discussed issues and, by way of consensus building, we arrived at what was to be done. Since I knew what we needed to achieve at the end of the project, I always provided insights for deliberation and so it was easy to agree."*

However, reflecting on a lack of personal leadership in the foreign team, **Participant 7** suggested that "*participants from resource-limited countries lead the projects as principal investigators.*" S/He explained that s/he has "*endeavored to identify grant opportunities myself and then request international partners to come on board. This is in an effort to be the PI of the project.*"

3.6 Finding 6—foreign perspective

In their reflections, participants seemed to adopt their collaborators' perspectives on various topics such as timeframes and project management. However, they expressed a desire for changes in their collaborators' viewpoints, particularly in leadership and budget considerations, to better align with the local context of the research projects. Additionally, participants reflected that often collaborators held unrealistic expectations for task completion times due to a lack of understanding of local infrastructure limitations.

Participants and their collaborators often had differing perspectives on reasonable timeframes for project tasks that appeared to stem from foreign collaborators' lack of understanding about local systems and processes. **Participant 2** summarized this lack of understanding:

> *"It is also very important for international partners to bring more realistic timelines as the IRB processes in the host country may differ and take longer than in their countries. Field implementation also has many challenges such as: delays, difficult access to roads, transportation, the need for local authorities to authorize the data collection,* etc. *Things move on a paper-based approach here rather than the internet, meaning that these processes take a lot of time. There was an unreasonable pressure to move things on tight deadlines set by international partners. In the end, there was an understanding but it took time to reach that. Overall, international partners need to be more aware of the realities in the countries they propose for research collaboration or at least be willing to hear from their collaborators."*

This participant was adamant about the need for collaborators to understand the perspective of local researchers, particularly related to time needed to achieve elements of the research process. **Participant 1** had similar reflections, although seemed more forgiving of the collaborators' lack of perspective:

> *"Collaboration with people from the States has helped achieve results faster and better. This international experience is a healthy one. The only problem is that sometimes there is pressure to ensure all deliverables are done on time. If this pressure can be reduced sometimes it will be appreciated. This experience with collaboration has helped influence my approach that you do not play with deadlines and that you have to have a communication plan and communicate effectively all the time."*

As an example of the benefit of aligning expectations, **Participant 9**, who had "*exceptional*" experiences in international collaborations, felt "*my responsibilities have been clearly laid down and I have had the required respect that demands the performance of my responsibilities.*" Similarly, **Participant 3** reflected that,

> *"My experience of working with my international partners made me believe that working with other partners would be seamless and hitch-free. I am now confident to work in a team on grant writing, while clearly agreeing on each other's responsibility and resource sharing formula from the beginning."*

Some participants struggled with foreign collaborators to develop clear understandings of leadership roles and team collaboration. For **Participant 6**, "*Our relationship is good although sometimes I feel that one partner, a senior researcher, tries to impose his rules and ideas to junior researchers, such as myself, without discussing first with all members of the team.*"

Later in the journal, **Participant 6** reflected on being mentored by a foreign partner and noted their different perspectives for professional relationships:

> *"My mentors would give me plenty of time to talk and discuss about the research work, but generally we did not discuss much about our personal lives. So, at times the meetings were too professional. I was not encouraged too much to talk about my issues other than the research topic. I particularly wanted their guidance regarding my future career development but maybe because of their busy schedule and other commitments they could not provide me guidance related to career development and the opportunities available in the public health field."*

4 Discussion

Interpreting the six findings with the frameworks (Self-determination Theory and Complex Systems Leadership Theory) and the literature review, we infer that participants were, (1) motivated by scholarly identity in collaborations, (2) depended on collaborations that were colonialist but beneficial, and (3) created change through leadership at the microsystem level (Table 3).

Similar to the literature (e.g., Färnman et al., 2016), participants participated in foreign training programs to strengthen their grant and academic writing and described positive impacts on their scholarly identity that stemmed from mentorship in these training programs and other foreign collaborations (Finding 4). Authors in the literature reported that researchers increased their ability to secure grant funding after foreign training. However, participants described desires for greater leadership and budgetary control, suggesting that they were not securing their own grants (Finding 5).

TABLE 3 Inferences with supporting elements (i.e., findings and frameworks).

Inferences	*Supporting elements*	
	Findings	Frameworks
Motivated by scholarly identity in collaborations *Participants enhanced their scholarly identity through foreign collaborations, which contributed to their motivations to remain engaged in research.*	Microsystem, scholarly identity	Self-determination Theory (competence, relatedness, motivation)
Depended on collaborations that were colonialist but beneficial *Participants depended on foreign collaborations for research support but encountered research colonialism.*	Macrosystem, mesosystem, foreign perspective	Self-determination Theory (autonomy) Complex Systems Leadership Theory (Unpredictability, Emergence)
Created change through leadership at local levels *Participants led at microsystem levels with a focus on collective decisions and they created change as they emerged as leaders in challenges.*	Microsystem, leadership	Complex Systems Leadership Theory (unpredictability, emergence, leadership)

Our findings aligned with descriptions of research colonialism in the academic literature (Tan-Torres Edejer, 1999; Chu et al., 2014) in which foreign researchers led the research and provided connections for funding (Finding 1). Similar to the literature, participants described leadership imbalances and being approached by foreign researchers with studies that were conceptualized elsewhere (Kok et al., 2017; Ward et al., 2017; Seo et al., 2020). However, contrary to the literature, participants noted being included in grant proposal development and almost half positively described their experiences in foreign research collaborations. Nevertheless, participants' descriptions of differing perspectives on deadlines and leadership roles (Finding 6) and the need to clearly define responsibilities at the outset of the grant (Finding 2) aligned with the literature (Nchinda, 2002; Vasquez et al., 2013; Munung et al., 2017).

All participants described their experiences of personal, institutional, and national challenges to establishing an independent, productive research career (Finding 2). Participants' descriptions of local challenges in funding, infrastructure, time, and mentorship were almost identical to the literature (e.g., Ager and Zarowsky, 2015; Kumwenda et al., 2017). Their descriptions of collaborating with foreign researchers to fill local funding gaps, as well as associated challenges of power imbalances, needing to align with funders' agendas, and a lack of agency, echoed the literature (Walsh et al., 2016; Harsh et al., 2018). Missing from the literature were the ways that productivity and careers were stagnated by biases and power dominance (i.e., research colonialism).

Many participants led local research teams and their descriptions of leadership aligned with elements of collective leadership (Finding 5) that were described in the literature (Denis et al., 2017; Edwards and Bolden, 2022). Participants generally described leadership as a group effort and through leadership, changed processes and policies for improved health outcomes.

4.1 Inference 1—motivated by scholarly identity found in collaborations

Through foreign collaborations, participants grew their scholarly identity, which motivated them to continue researching. Participants received mentorship, which instilled feelings of relatedness with the global research community and led to collaborations, publications, and conference presentations, which increased their feelings of competence and self-efficacy.

Extrinsically, participants were motivated by recognition from publication and engagement on an international stage. Intrinsically, participants were motivated by their research contributing to the evidence base for changes in healthcare policies. Locally, they influenced leaders who changed clinic protocols and testing procedures. Participants were invited to national and international policy discussions in which they shaped policy change.

Relationships were foundational elements of participants' motivations and experiences in foreign collaborative research. Collaborations provided pathways to improve health outcomes as well as positive feedback and recognition, which motivated participants in their research aspirations. Participants' motivations to research moved them to remain engaged in foreign collaborations to fund their research endeavors, which further fueled their research motivations. Participants' engagements in collaboration and research shaped their scholarly identity and created a positive feedback loop that motivated their investment in research (Figure 1).

4.2 Inference 2—depended on collaborations that were colonialist but beneficial

Faced with limited local research funding and infrastructure as well as discriminatory biases in international academic spaces (e.g., journals and grant funding), participants used foreign collaborations to address these challenges and support their research endeavors. However, in doing so, participants experienced overt and subtle foreign dominance and power imbalances (Figure 2). These experiences were pervasive throughout the research process and characteristic of research colonialism described by authors in the academic literature.

A colonialist environment was evident at the international macrosystem level through biases against participants when they tried to publish in international academic journals without foreign collaborators and in the high costs associated with publishing research articles, international conference registration, and international training. Furthermore, despite being outside the community being

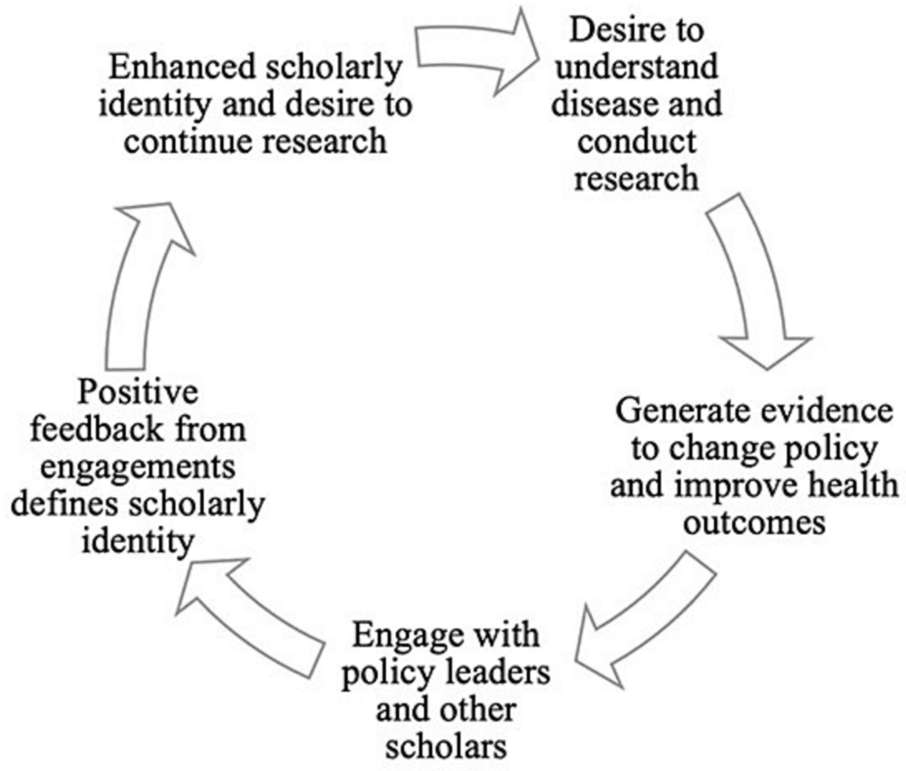

FIGURE 1
Feedback loop: motivation, research, scholarly identity, and foreign collaborations.

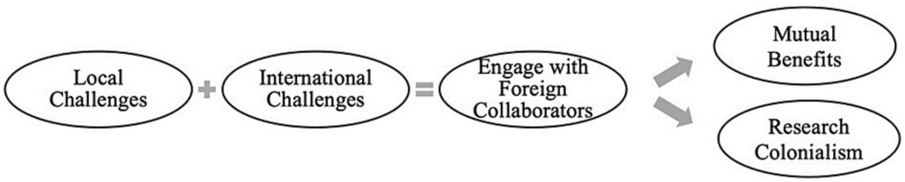

FIGURE 2
Navigating challenges through foreign collaborations (colonialist but beneficial).

researched, foreign funders often controlled the research agenda and required that local training be led by foreign researchers rather than local experts. These macrosystem challenges added to the microsystem challenges that participants encountered.

Despite challenges at the international level, participants leveraged foreign collaborations to navigate through local challenges, creating a mesosystem between the local and international systems. Participants used grant funding from collaborations to conduct studies, publish articles, and attend training programs. Through training programs and mentorship, they described strengthening their skills in grantsmanship and academic writing. With increased competencies, they were more confident in applying for grants and making change in their institutions.

However, in an environment of research colonialism, participants depended on foreign researchers to approach them to initiate collaboration. In this dependency, participants lacked autonomy and were often disempowered to fully lead grants. Foreign researchers were empowered by funding mechanisms that prioritized them over local researchers as grant leaders. Once engaged in foreign collaborations, participants also experienced power imbalances through funders' preferences of foreign collaborators to control budgets and lead training. This view permeated through the research team, sometimes influencing local team members to favor the foreign grant leader.

4.3 Inference 3—created change through leadership at microsystem level

Through adaptive interactive behaviors, participants demonstrated leadership within complex systems and led local teams. When challenges arose, participants adapted through

TABLE 4 Recommendations for practice based on the study inferences.

Recommendations	Rationale
Encourage bidirectional training and mentoring opportunities	Increase feelings of relatedness that motivates continued research as well as collaborators' investment (Inference 1)
Require participation in power assessment and training as prerequisites for international grant funding	Decrease foreign dominance and subtle research colonialism in collaborations (Inference 2)
Prioritize local leadership and perspective in research grants	Decrease dependency on foreign collaborators (Inference 2) and increase opportunities for grant and budget leadership (Inference 3)
Review leadership responsibilities and leverage collaborative leadership	Enhance opportunities for leadership and leverage collaborative leadership that leads to change through challenges (Inference 3)
Remove publication barriers (e.g., reduce or waive publication fee) for researchers in LMICs	Increase scholarly recognition and identity for researchers (Inference 1) and diminish research colonialism (Inference 2)

linking with foreign collaborators. Complex Systems Leadership Theory proposes that to overcome challenges in a system, individuals should link up to develop adaptive behaviors that will become superior to previous actions. In navigating challenges and influenced by their foreign collaborators' perspectives, participants demonstrated leadership and changed norms in their spheres. Whether through asking a journal to waive publication fees, negotiating for research time, or building a local grant administrative team, participants' actions created new local precedents. Furthermore, participants used collaborative research to solve problems related to disease and community health. Through linking with others, participants provided evidence for new policies to improve health outcomes.

However, despite leading their local research teams and emerging as local and national leaders, they lacked substantial leadership in the foreign team due to an environment of research colonialism. As they mitigated local challenges through foreign collaborations, they often encountered new challenges (i.e., power imbalances). Participants discussed ways that they strived for increased leadership and autonomy in their collaborations, and some demonstrated that they were beginning to make changes. Their motivations to research pushed them to link with foreign collaborators and subsequently enhanced their competence and strengthened their desire for increased leadership. Through sustained engagement, it could be presumed that participants continually embark on larger change and increased leadership, which may decrease the power of foreign dominance and research colonialism over time.

4.4 Strengths

Our research participants represented a diversity of countries, backgrounds, and research interests (see Table 1), which helps generalize findings to a larger population. Additionally, because they were currently involved in research and have been for a range of years (at least 2–15), experiences may have spanned over a decade and shed light on long-term as well as recent issues in international collaborations. The use of journals provided participants time to reflect on questions and respond in a thoughtful manner. Furthermore, the tool also created distance between researchers and participants and allowed participants to remain anonymous, which may have increased participants' honesty in their answers.

4.5 Limitations

There were several limitations in this study. The participants involved in the study had been trained at the lead author's institution and participants may have been hesitant to share demeaning experiences. Journals did not permit follow up ("probing") questions after submission, which could have been used to gather additional descriptions about an experience. Furthermore, the written reflections did not capture body language nor voice intonation that may have aided in the interpretations of responses. Finally, we did not seek to understand the impact of variations in cultural and regional perspectives, and these variations may have impacted how participants interpreted experiences.

4.6 Recommendations

Based on the findings and inferences, we recommend five actions for international collaborative research and future research directions in Africa (Table 4).

5 Conclusion

Our study shows the important role of foreign collaborations for researchers in Africa as partnerships enhance their scholarly identity and help them overcome challenges in funding and mentorship. At the same time, this research linked study participants' engagement in foreign collaborative research with research colonialism. The participants experienced overt and subtle research colonialism as there were power imbalances at all stages of grant and research processes, even when the participants reported being satisfied with the collaboration. A major concern is the foreign collaborators' lack of understanding of issues pertaining to time constraints and infrastructure deficiencies in the local setting. Strengthening systems leadership in research through training and mentorship could continue to increase self-efficacy and competency of African researchers. Paired with greater awareness of and action against bias and power dominance by foreign funders and collaborators, the presence of research colonialism in academic biomedical research might decrease and give space for local, African researchers to lead grants in their communities.

Data availability statement

The original contributions presented in the study are included in the article/Supplementary material, further inquiries can be directed to the corresponding author.

Ethics statement

The studies involving humans were approved by IRB Committee, Vanderbilt University, United States. The study was conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study.

Author contributions

ER led the conception of the work, acquisition of the data, and initial manuscript draft. MA, HB-M, and TB made substantial contributions in the interpretation and analysis of the data for the work and edited the manuscript. All authors approved the work for publication, and agreed to be accountable to all aspects of the work.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Supplementary material

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Integrating multi-national teams: over a decade of lessons learned in Chiapas with Partners in Health-Mexico

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In a globalized world where pathology and risk can flow freely across borders, the discipline of global health equity has proposed to meet this challenge with an equal exchange of solutions, and people working toward those solutions. Considering the history of colonialism, ongoing economic exploitation, and gaping inequities across and within countries, these efforts must be taken with care. The Partners In Health program in Chiapas, Mexico was founded in 2011 by a team of leaders from both the United States and Mexico to strengthen the public health and care delivery systems serving impoverished rural populations. Key to the strategy has been to marshal funding, knowledge, and expertise from elite institutions in both the United States and Mexico for the benefit of an area that previously had rarely seen such inputs, but always in close partnership with local leaders and community processes. With now over a decade of experience, several key lessons have emerged in both what was done well and what continues to present ongoing challenges. Top successes include: effective recruitment and retention strategies for attracting talented Mexican clinicians to perform their social service year in previously unappealing rural placements; using effective fund-raising strategies from multinational sources to ensure the health care delivered can be exemplary; and effectively integrating volunteer clinicians from high-income contexts in a way that benefits the local staff, the foreign visitors, and their home institutions. A few chief ongoing challenges remain: how to work with local communities to receive foreign visitors; how to hire, develop, and appropriately pay a diverse workforce that comes with differing expectations for their professional development; and how to embed research in non-extractive ways. Our community case study suggests that multinational global health teams can be successful if they share the goal of achieving mutual benefit through an equity lens, and are able to apply creativity and humility to form deep partnerships.

KEYWORDS

community health, global health equity, transformative education, rural health care, anti-colonial action, anti-racist action, public private partnerships

Introduction

> "The most radical thing we can do is connect people to one another." – Rosabeth Moss Kanter

The promise of global health has been that it can inspire and coordinate efforts that will improve an equitable access to health for all. In contrast to colonial medicine, tropical medicine and international medicine, the new and better approach promised by global health has been to confront the systems that allowed for great disparities in health outcomes across the globe, initially most prominently in access to treatment for HIV, but increasingly in access to what has been termed universal health care (1). Nevertheless, these processes inherited centuries of historic injustices and ongoing economic extraction between different groups. These differences have sometimes been envisioned as a Global North and a Global South, with the colonial legacy perpetuated even within countries, such as in the rural–urban divide, or within groups, such as the divides of gender, ability, race, class, ethnicity, LGBTQ+ status, etc. (2) Any group hoping to work thoughtfully with another group that has a different worldview, and that may have been historically marginalized, should understand both the history leading up to that moment and the current position that this history has put each group (3).

This was our understanding when founding Compañeros En Salud (CES), the Mexico branch of the United States non-governmental organization Partners In Health (PIH), currently operating in Chiapas, one of Mexico's most impoverished and marginalized states. Formally launched in 2011 as a healthcare strengthening organization for rural primary care in partnership with the Mexican government, it drew upon decades of local experience, relationships in the area, and partnerships with institutions far away from Southern Mexico. Most importantly, this included fundraising in the United States and collaborations with universities, either through formal partnerships or more informal coordination, such as Harvard Medical School, the Tec de Monterrey, Universidad Nacional Autonoma de Mexico, la Facultad de Enfermeria y Obstetricia, Notre Dame, and others. This all afforded CES access to increased funding not available to most other groups in the region, and a pool of talented staff that traditionally had not chosen to work in the area. With this foundation of improved inputs, CES was able to more fully implement core components of a functioning health system, what PIH has formulated as "the 5 Ss" (Staff, Stuff, Spaces, Systems, Social Supports) (4).

In addition to offering an improved clinical space for Mexicans, CES has also found a way to include trainees from the United States, and to a lesser extent Europe, looking to incorporate global health rotations into their training. Also known as the short-term experience in global health (STEGH), these rotations grew rapidly in popularity in the first decade of the 21st century, reaching a peak in 2010 when 30.8% of all graduating medical students in the United States reported such experiences (5). Their experiences with STEGHs, however, had been mixed, with many describing challenges arising from medical students being asked to perform outside of their level of training and being traumatized in the process (6), or local hosts feeling that the medical visitors were ill prepared to contribute meaningfully in a context they did not yet understand (7). CES created a system that above all else aimed to respond to the call to "design new instructional and institutional strategies" that can provide transformative educational experiences to health professionals (8). The goal was to design an educational program with clearly delineated roles and responsibilities so that that the experience could be equally as impactful for both Mexican and United States-trainees, and patients. What follows is a detailed account of our experience in building and running the educational aspects of this program, recognizing that what we present is framed by our unique vantage points and biases as co-founders and program leadership.

Context

Chiapas, is the southernmost state of Mexico. It is blessed with abundant natural wealth, but it also contains some of the most impoverished and marginalized communities in the country. This is not by accident; Chiapas has long been positioned as an agricultural and mining region within Mexico, where industrialization and development have fallen far behind compared to the rest of the country (9). More so, the communities where CES started operations are about 8 hours away from the closest urban centers. Getting there involves traveling for hours on unpaved roads, on the back of pickup trucks that run perhaps once a day, or through unsafe mountain roads where deadly accidents are still all too common (10).

The design of the Mexican Health System intended to cover the entire population through a vast network of primary health centers, present in most communities in the country, with referral capacity to higher level hospitals. According to WHO data, Mexico has a physician density of 24.1 per 10,000 people, compared to 35.5 in the United States (11). However, in neither country doctors are equally distributed. The 6 million people living in Chiapas have access to only two tertiary care level hospitals, and most services are concentrated in the four biggest cities. In hundreds of small communities across the state, care is provided through the smaller health centers, although the most remote places struggle to find permanent medical staff and are sometimes barely functional as a result.

The Mexican ministry of health (MoH) offers contracts available for doctors to work in some of these communities, and promises a higher salary as an incentive, however, it is very rare that doctors decide to work in such communities. A similar phenomenon occurs in rural areas all over the world, including developed countries like the United States (12). In 1935, the Mexican government attempted to address this issue by instituting a year of mandatory social service, where newly graduated doctors are obligated to work for the MoH in order to obtain their medical license (13). The majority of these newly graduated doctors, called *pasantes*, are still placed to this day in rural areas to cover for hired doctor shortages. For most of this program's history across Mexico, the *pasantes* were the sole providers for one or more communities, usually while having limited access to tools and supervision (14). CES operated by engaging with physicians about to start their social service year and enticing them to work in these communities by offering a package of economic and academic incentives (15). These young physicians were scheduled to graduate from the program each year, but CES has been able to attract new hires to replace graduates and therefore guarantees continuity of care. Many graduates have even opted to stay longer to work with CES in a leadership position or as a clinical supervisor. In general, *pasantes* have limited clinical experience, and although the Mexican health system allows them to oversee their health centers, CES realized early on that they would benefit

from support and mentorship from more experienced clinicians. The majority of this clinical supervision is provided continuously by the cadre of clinical supervisors, the majority of whom are recent Mexican graduates of the CES *pasante* program. To augment this foundation of in-house supervision and mentorship, CES also implemented a program for hosting foreign clinicians who could come to participate in a purely teaching capacity.

Since the first class of *pasantes* joined the program in 2013 up to the writing of this paper there have been a total of nearly 100 *pasantes* working in 9–10 primary care clinics, and later participating in a local referral hospital and a maternal waiting home, though staffing for those clinical entities involves even more clinicians. During this time, around 150 foreign medical volunteers have rotated through the clinics. This is within the context of CES hosting over 300 total volunteers, many for longer placements such as recent college graduates and gap year medical students who worked from 6 to 12+ months as research assistants, program coordinators, or office volunteers. See Table 1. The CES program is experienced by participants as a squarely Mexican run clinical program that is enriched by a large cast of rotating foreign visitors whose work is interwoven with daily operations.

Details about key programmatic elements

Most countries in the world require that clinicians have a domestic license to practice medicine, and Mexico is no exception. Global health projects from the Global North have often been rightfully criticized for sending unlicensed or partially trained staff to treat patients in the Global South (16). Even for fully licensed clinicians, the question remains of whether practitioners for the Global North should be allowed to practice freely in the Global South for only short visits, as the opposite would never be possible (17).

As soon as CES started clinical operations in 2012, it began attracting physicians from the United States who wanted to do global health rotations during their residency. They visit usually for 1 month and are paired with the Mexican doctors at their community clinics. The United States residents act as bedside clinical educators and coaches, working in the spirit of what PIH calls "accompaniment." This is a philosophical stance, but also a rubric for programmatic design (18). At CES, the Mexican doctors remain responsible for the patients' care and have the final say about the diagnosis and treatment. Legally, United States residents are acting as visiting students, in the same way that foreign students rotate in the United States, acting always under the supervision of local professionals and therefore contribute without violating any Mexican regulations.

TABLE 1 Visitor log: total number of visitors by category since CES formally launched.

Category	Number
HEAL rotating fellow	8
General visitor	20
Clinical volunteer	151
Research volunteers	18
Non-clinical volunteer	121
Uncharacterized	10

For global health programs in Europe and the United States, it is important to find field placements that fulfill the student's learning and exposure expectations. The United States residents in CES are mentored by the CES medical director, who serves as a bridge between the practice of medicine in the United States and in rural Mexico. This position has historically been held by both US and Mexican physicians, showing how success in this role is determined not by nationality alone but by the ability to be an inclusive mentor. See Box 1 for further information on how CES structures the visit in order to set clear expectations and facilitate a beneficial experience for the pasante, the United States visitors, and patients. Additionally, even though many of the visiting residents have had only limited experience in resource constrained settings, they are instructed during their orientation on the relative lack of diagnostic and treatment resources in the rural CES clinics. Accommodating to this reality can be a struggle for some, so the CES cadre of clinical supervisors will often pay extra attention to supporting those clinicians when they visit them in the community; through ongoing on-site reflection and discussion, many of these foreign clinicians are able to learn how to provide high-quality clinical care in rural Mexico through the tutelage of their more experienced Mexican colleagues.

For care delivery organizations in the global south, it is important to benefit from visitor's expertise; many patients in CES-supported communities who presented with more complex diagnoses, for example for neurologic or cardiologic conditions, could get access in their local clinic to a team of clinicians thinking about how best to address their health concerns. Otherwise, traveling to see a specialist in the few referral hospitals could be quite expensive, difficult logistically, and may not even result in a favorable outcome. Through this partnership, thousands of patients were able to have access to better care and follow up, without leaving their communities and without losing continuity with their local doctor, which can result in both clinical and economic benefits for the patients. Notwithstanding, any patient who seeks help from CES and ultimately needs specialist care is still accompanied to receive that care, usually in the urban medical centers, through CES's "Right to Healthcare" program (19).

Table 2 shows select quotes gathered from exit surveys submitted by visiting doctors. These were collected during exit interviews that included opportunities for both verbal and written feedback. Concerns and criticisms were usually discussed and addressed verbally, so written submissions nearly always captured generally positive responses. These do not represent a complete analysis, but rather are included to give a sense of how this program performed at its best. The responses suggest that with proper preparation and mentorship, visiting residents can balance both learning and service without causing harm to patients or engaging in unregulated practice. Exit interview responses from Mexican pasantes were not routinely recorded but in verbal interviews with CES leadership they nearly universally expressed enjoying the company of a fellow physician in their clinics and their communities, having a companion at a time that could otherwise be a terrifying assignment. Both parties regularly expressed feeling that they were supporting and teaching each other. A more complete and rigorous analysis that includes the opinions of all staff, participants and graduates of the program should be conducted. The Brigham and Women's Hospital IRB reviewed inclusion of the quotes and determined that as presented are not human subjects research (REDcap ID #679).

BOX 1 How CES operationalized equitable collaborations in medical contexts.

United States medical trainees and professionals who were interested in working with CES were given a set of very clear rules of engagement that both clarified the ways they could get involved, and the things they should not do.

Getting there

Each applicant is interviewed in Spanish to see if their values, personal approach, and Spanish-language skills align with CES. Translators are not used, so each participant must have at least a functional level of Spanish. The time that participants contribute is commensurate with their level of expertise: college and medical students are asked to give at least 6–12 months; residents are asked to give at least 4 weeks, and attendings are allowed to visit for less time, usually around 2 weeks. Visitors are not charged for the experience; they only have to pay for their own flight, and upon arriving are picked up and brought to the CES offices by CES staff. There they are given an orientation to the team and the CES approach. It is made very clear that their presence is governed by an overriding and non-negotiable rule: if anyone in the CES staff feels that their presence is not beneficial for the team, they will be driven back to the capital city where they can spend the rest of their time on their own. This is said in a friendly and supportive way, but it makes it very clear who is in charge. As of the publication of this paper, less than 1–2% of all volunteers have acted in ways that led to their disengagement with working with CES.

After the initial orientation in the central coordination site in the larger town of Angel Albino Corzo (locally known as Jaltenango), the visitor is driven out to a rural community by an experienced driver in a vehicle that can safely make the trip. There, they will be greeted by the Mexican *pasante* who has coordinated where they will stay and what they will eat. This usually means living in a local house and eating with a local family in conditions not much different than what the average patient experiences. They will awaken to the sound of roosters and will spend most nights making house calls and drinking sweet coffee by a wood-burning stove. There is limited electricity and little to no internet.

Working together in the clinic

In the clinic, the visiting doctor is instructed to sit to the side of, and slightly behind, the Mexican doctor. They are to watch the clinical interaction but are invited to ask any clarifying questions while the Mexican doctor is gathering their history and conducting a physical. From there, both leave the room and go to an adjacent pharmacy where they will discuss the case. This presents a natural opportunity for the visiting MD to teach about medicine away from the patient who might interpret such an interaction as one MD being superior to another. The Mexican doctor will usually, in turn, educate the visitor on local contextual factors that might affect the diagnosis and treatment plan. After selecting the treatment from the fully stocked pharmacy, both will go back to the examining room, but only the Mexican doctor should explain to the patient the diagnosis and treatment plan.

Formal course work and community

Each month, all the *pasantes* in each of the rural clinics where CES works gather in the central CES offices to restock their pharmacies and to receive part of a course (locally known as "dias de curso"). In addition to reviewing purely clinical and social medicine topics, the course focuses on how broader socio-economic and political factors affect health, what have been called the "actual causes of poverty;" centering these insights, often from the perspective of those in the Global South most affected by these processes, helps to avoid depoliticizing international experiences such they become only an exercise in self-actualization for the already privileged (45). The visiting MDs are given the opportunity to teach a session if they want, and to engage on a social level with the larger team. Despite the serious content covered, this is usually a joyous and educational event and presents an opportunity to get much needed rest, re-energize, and build community. At the conclusion of their time with the CES team, the visiting doctors usually opt to add a few free days to visit local sites before returning home. Many visitors have reported this experience to be a crowning jewel of their medical training, and that the relationships they form are set to last a lifetime.

How does CES work to keep local needs central to how it makes decisions and operates?

If the leadership, funding, staff and visiting supports are mostly not from the same area as the patients, there is a very real risk that the interventions can be positioned as benevolence or charity, instead of a mutual partnership working together to overcome locally identified problems. CES was designed from the beginning to address such concerns by embedding key programmatic mechanisms in its structure and operations. First, because CES was founded after years of preliminary work in the area, we heard a clear mandate from every individual patient and community leader, be it through local churches, coffee farmer cooperatives or *ejido* groups, that revitalizing defunct government clinics was a priority. In operating the clinics, the *pasantes* were expected to live in the communities for most of the month, instead of leaving every weekend to hand in paperwork to the jurisdiction offices; this required forming an agreement with the jurisdiction leaders to accept such a rhythm of data flow, but it also allowed the *pasantes* working with CES to fully immerse themselves in local life. As such, they were also shown how to rent a room and eat their meals in local houses, always paying a just wage to the hosting families for that support (See Figure 1). Similarly, when launching a new program, such as a community health program (20) or a shared medical appointment program for diabetes (21), the *pasantes* were encouraged to formulate their plans with local leaders, such as elected officials and community health committees.

CES leadership made an early tactical decision to not put the head offices in the state capital or the more comfortable tourist towns, billed as magical places, or "pueblos magicos." This was because we knew that proximity would facilitate more and better conversations with the communities we were serving. As such, all of the support staff, from drivers and cooks to accountants and office managers, were hired from the local area, and they have remained some of the most continuously employed members of CES. The organizational culture was purposefully maintained as being very horizontal, with every staff member being

TABLE 2 Example themes heard from visiting MDs from feedback exit surveys.

Theme	Quote
Mentorship	*"This was an amazing opportunity for me and really separated it from experiences I have had in global health previously… Teaching is what makes the rotation so impactful and the pasantes were open and excited to be taught."* *"The pasantes and structure of the rotation. I loved working one-on-one with them. I also really enjoyed the dias de curso. I was happy to be able to help with a presentation."* *"The opportunity to be immersed in the community with the pasante and teach in a responsible way."*
Clinical experience	*"As for medical knowledge, in the face of a remote rural setting with limited resources, I was exposed to the TRUE ART OF MEDICINE. The resident experience that CES provides is unparalleled and unavailable anywhere in the United States."* *"[I enjoyed] The house calls in the community-you never knew what you were walking into"*
Community	*"I truly enjoyed my experience in [this community]. I felt well integrated into the community by eating meals with local families and taking part in house visits."* *"The meals provided [by the host family] were also extremely wonderful and a great way to get to know the people in the community more intimately."*
Mentorship + Clinic Personnel	*"[The pasante] was absolutely fantastic to work with and included me in medical decision-making. The clinic was well organized by [the pasante and the nurse]."* *"[The community] was an amazingly beautiful community and [the pasante] quickly became a close friend. The nurse was extremely helpful in the clinic and we had everything we needed most of the time. Wonderful experience!"*
Health system	*"I learned so much about how to navigate a health system with few resources. It may have been helpful to be debriefed on PIH practices-pasantes/acompañantes and the emergency system before going out into the community. I found this to be really interesting once I learned about it as well as integral to our work."*
CES	*"I enjoyed the people and the environment. There's a strong sense of community and shared mission that was really contagious."* *"Getting to know all of the CES "banda" was definitely the best part! To meet everyone, from drivers to supervisors and all in between, was such a great opportunity for networking."* *"Two things [were my favorite parts]: 1) Getting to spend time with just about everyone involved in CES, mostly due to the course which was also wonderful to experience and participate in and 2) In-community resident experience allowing time for clinical teaching while simultaneously learning so much about the health system."* *"Working with other people that are so passionate about serving the communities of Chiapas! I appreciated that everyone was open, really knew each other, and really worked together on many different projects."* *"It is a great community of dedicated people. I enjoyed learning from everyone and getting ideas about how to improve health care, not just in Chiapas but other areas as well."* *"I believe you guys are doing a great job/service not only to the members of the communities in Chiapas, but also around Mexico by helping to further train the medical students (pasantes). Having them staff patients with you guys and having supervisors is a great idea because you are also contributing to form better physicians, who can then hopefully provide a better quality of care no matter where life takes them to serve later on. I admire you are work and learned very much from the health model you apply. Thank you very much about this experience."*

encouraged to share any of their ideas and concerns with top leadership at any time. Although it would be impossible to immediately act upon every report, this structure opens the opportunity for frontline insights being available to directly influence strategy and implementation tactics. Finally, CES implemented a NGO-run pilot community health worker program early on, and developed the program to both be a source of support for patients with chronic diseases and a direct pipeline of contact with community members. The structure of this program is further outlined in other publications, and recently has undergone a transformation toward professionalizing the CHWs' position at CES (22). PIH has long worked under the premise that "community health workers are the biggest defense against the ignorance of the expert" (23) but this is only if what they say is heard. Many of the CHWs, nearly all of them women, grew in their leadership roles in the communities because of their work with CES, and as such have been increasingly more valuable allies to CES. The ultimate goal is that the experiences with this program influence the broader national conversations on community health in Mexico.

Similarly, while the visiting residents are valued, they are not positioned as indispensable. Of note, the addition of visiting foreign residents did not erode or make the CES system dependent on them, as the quantity of patients seen by the pasante-resident team doctors was the same as when the pasante was alone. Similarly, after observing that resident collaborators function best when they can engage in long-term relationships through repeat rotations, CES has worked to facilitate agreements with United States training programs so that the best residents can rotate more than once.

What are ongoing challenges that remain difficult to fully address?

Questions about the presence of foreigners

As with any intervention, there will always be countervailing forces and unintended consequences. In the communities, there was an initial period of adjustment with so many foreign faces suddenly showing up to a community that had previously almost never seen foreigners. Similarly, despite all the efforts taken to keep the Mexican doctor central to care delivery, some patients still request that they be seen by the foreign doctor in the mistaken belief that they might get better care. This was interpreted as a key example of internalized bias. These challenges were confronted directly by discussing with community members, either individually or in community fora, the reasons why

FIGURE 1
The CES model of training in action. A medical doctor visiting CES from the United States converses with a Mexican doctor completing his social service year and a community health worker active in the area, as they share breakfast in a neighbor's house prior to a day of work in the community clinic. This meal is prepared by locals, almost always women, but they are appropriately reimbursed and this system has become an important source of revenue for hosts. The families will also often sit and share the meal with the doctor and team, thereby offering an opportunity to share and learn together in an informal domestic setting.

foreign doctors were visiting. When patients later saw these visiting doctors living in the communities in the spirit of humility and service, this went a long way to win trust and form positive working relationships. For CES, the working principle is that the health system can win trust by working as a health system that aims to be trustworthy.

Of note, the Mexican doctors who work and train with CES often come from the middle-and upper-middle class of Northern Mexico, and are often taller and lighter in skin tone when compared to the Chiapanecan patients. As such they are sometimes lumped together with the other "gringos" (a complex term that can be spoken as a disparaging term or used simply as an identifier, but we include it here because it is often used by community members). Most of the Mexican doctors from Northern states have been surprised to hear this. When they protested, some local patients have humorously applied the term "gringos con pelo negro" (gringos with black hair) for the Mexican doctors. On the other hand, some of the doctors from Chiapas, who often look and speak more like the local population, have expressed that they will sometimes have to work to come across as equally as credible as the newly arrived doctors. In a confrontation between region, race and class, the idealistic Mexican doctors who came to work with CES learn important lessons about the axes of difference that can exist even within a national territory.

A related concern is how to facilitate diversity in the visiting professionals. For the doctors, this includes diversity in race, class, and region of the United States; since global health does not have a federal funding mandate in the United States, it remains mostly, but not exclusively, prevalent in elite private coastal institutions. Similarly, beyond United States trainees, CES has benefited tremendously from the perspectives and experiences offered by visitors from other countries and continents, such as Haiti and other parts of Latin America, Asia or Africa. Current funding availability makes such visitors far less common. Beyond doctors, CES recognizes that a similar program with other cadres of health workers, such as nurses and advanced practice practitioners (APPs), would bring great value; despite an initial (24) and sustained focus on nurse training in CES, United States nurses and APPs have far fewer opportunities to participate in global health rotations abroad.

Facilitating long-term career options for CES graduates

Many of the Mexican and visiting doctors have expressed interest in working with CES as a career option long-term. In fact, the training program has served as a powerful recruitment tool for CES as it hires new cadres of supervisors and program directors. We interpret this as a success because CES has been able to inspire doctors to continue working in a rural area that has normally faced severe staffing shortages. Setting equitable salaries for these full-time professional staff continues to be an ongoing negotiation, especially if a United States-trained and Mexico-trained doctor are hoping to do similar work but have different expectations about their salaries. In short, United States-trained physicians can make over 10x the salary of a Mexican if they stay in the United States. Many need to make this amount if they hope to pay for their student loans and save enough to retire in the United States (25); the average medical debt for United States medical graduates in 2022 was $205,307 USD (26). At the same time, it would be deeply unfair for the doctors who train in Mexico to make dramatically less when compared to their United States-trained peers simply because of their country of origin. Similarly, the most talented Mexican graduates usually have options to make a salary similar to that seen in the United States if they work in the private sector in Mexico, thereby putting them in a similar situation to their United States-trained counterparts if they choose to work with CES in rural Chiapas. As such, there must be a constant negotiation between how much different cadres of doctors can be expected to lower or increase their salary expectations (27, 28). Some organizations have addressed this challenging situation by creating single salary scales and adjusting salaries according to the cost of living, instead of the nationality of staff. Global health organizations have the potential to become great equalizers when it comes to stop perpetuating the labor practices that facilitate staff from the Global North and in the private sector to develop fruitful careers, while workers from the Global South and in the public sector remain positioned as laborers. Solving these inequities will require both thoughtful management solutions within international organizations, and an increase in the total funding available to such organizations.

How to best embed research into the care delivery program

Another core area of tension remains the value of research. It has been well described that too much research is not actually returning enough benefit to source contexts, and is often not available when locked behind paywalls (29), and in the era of Open-Access publishing may favor well-funded authors disproportionately having their voices heard over authors who struggle to pay the publication fees. As such, there is a call for the practice of extractive global health research to end, such that a more inclusive and collaborative research practice can take its place (30). This ideal would be marked by published works that reflect the priorities and narratives of those who stand to be most affected by the impact of the research, such as

through policy change inspired by the findings. There are important systemic factors that make reaching this ideal difficult; for many United States-based researchers, if they do not publish, they will not be promoted in their academic institutions, or they may lose their jobs altogether. This creates a false urgency in extracting data and processing it for publication. Working in impoverished contexts to build up local capacity to control their own research and advocacy agenda takes time. Few to no United States academic medical centers currently put value on this process of building local capacity as a criterion for promotion (31). At CES, despite early examples of rigorous implementation science being embedded into care delivery, such as an early version of the CHW program being rolled out as a stepped-wedge trial (32, 33), service and care expansion ultimately took precedence over research. Producing scholarship, however, has remained an important priority, and has been driven by the doctors and collaborators working most closely with the communities to build their own research agenda, especially after gaining further training in research methods, such as through participation in the HEAL initiative (34) or through getting further education in the United States or Europe and then returning to equity-focused work (35), either in Chiapas or similar contexts. Ironically, even if Mexican researchers can control the research agenda, they will find that they must still choose between publishing in their own language or aim to publish in English with the goal that this will lead to greater influence.

Discussion

CES was launched from a mixture of early experiences in the area (36), new energy sparked by the rise of global health as a discipline (37), and the need to meet increasing student demand for meaningful experiences in the field (38). Invigorated by the moral clarity that health is a human right, we as co-founders and leadership of CES recognized that by marshaling the necessary resources, we could build a health care delivery and educational system that would be locally transformative and internationally relevant. Now with over a decade in operation, CES continues to grow. This has included expansion into a maternal waiting home to provide more person-centered birthing care, revitalization of one of the referral hospitals, and during the COVID-19 pandemic, a renewed focus on provider safety and access to intensive care (39, 40). The CES experience suggests that privilege can be leveraged to redistribute capacity and human resources, and build systems that extend improved care to communities that need to be supported on a priority basis. If well designed and managed, this enterprise can be used as a beacon experience for training the next generation of professionals who hope to do similar work. The convening force of such a program can also generate a common and shared space that builds a multi-national community of change agents who can continually turn to each other for advice and inspiration.

It is important, however, for any organization to reflect at regular intervals, such as after the collective trauma that was the COVID-19 pandemic, to reconsider why and how the work is being pursued. The most recent 2023 AAMC graduation survey discovered that United States-based medical students now self-report a level of participation in global health experiences that is nearing a low rate not seen in nearly three decades; after a height at 30.8% in 2010, the rate dropped slightly in 2019 to 24.2%, but then continued dropping to 14.2% in 2022, and finally reached a new low of 11.3% in 2023 (41). The reasons for this are likely many, but we suspect that many United States and European students have recognized that they can pursue their professional interests in equity by working domestically, especially considering the important and active struggles that arose from the murder of George Floyd, the repeal of reproductive rights in the United States, and the rise of far-right extremism that increasingly pushes anti-immigrant rhetoric and policy, etc. Many others are concerned about the environmental impact of international flight to participate in only a short-term experience (42). There is also an ongoing conversation on how to best embed anti-racism and anti-colonialism praxis in global health (43).

The CES experience shows how a clinical and educational program can be built to structure equitable interactions between people who may be dissimilar in terms of nationality, region, race, class, gender, ability, and other axes of difference. The tactical design principles described here can serve others hoping to launch similar programs. A lot of attention has been paid to the potential unintended consequences of work in global health (44). There still remain, however, many threats to human health globally that are the result of actions by actors who have all the intention to gain profit regardless of the effects on people or planet. The CES experience suggests that global health does not need to abandon finding ways to work together. Instead, global health efforts can be structured to unite like-minded individuals in multi-national teams to work in common cause as we confront the biggest threats to our common future, but always by centering the perspectives of those in the Global South who stand to be most affected by these threats.

Acknowledgment of any conceptual constraints

This report was written by the co-founders and current leadership of CES to be a descriptive tour of what we see as the key lessons from our experience. We are aware, however, that these descriptions are tainted by our personal investments in the program. While there are many benefits to how we have chosen to work, there are alternative models for pursuing social change, and we invite the discussion comparing and contrasting different approaches.

Data availability statement

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

Ethics statement

Ethical approval was not required for the study involving human participants in accordance with the local legislation and institutional requirements. As the Mass General Brigham IRB determined that the content and activities presented in the manuscript do not constitute human subject research, written informed consent for participation was not required in accordance with the national legislation and the institutional requirements. Written informed consent was obtained

from the photographed individuals for the publication of identifying images.

Author contributions

DP and HF wrote the original draft. VM provided conceptual and editorial support in writing the manuscript. All authors contributed to the article and approved the submitted version.

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Talk the talk and walk the walk: a novel training for medical students to promote decoloniality in global health

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To date, the history of colonialism has permeated nearly every aspect of our conceptions, structures, and practices of global health; yet, there are no published medical school curricula aimed at promoting decoloniality in global health. We developed a pilot course for medical students to examine the history of colonialism, power, and positionality; promote self-reflection; and teach strategies for dismantling coloniality in global health. This five-part course was offered to students completing a scholarly project in global health with a mixed in-person/virtual format and online pre-session preparation materials. A pre-course survey on prior experiences in global health and self-efficacy was administered, and a reflection piece was analyzed for themes. After completion of the course, the students again completed the self-efficacy questionnaire, a course feedback survey and a semi-structured interview that was analyzed for themes. On average, the students felt that the course was relevant to their global health scholarly project and that the course met their learning objectives. There was a trend toward increased self-efficacy in decoloniality knowledge and skills following the course. In the post-course structured interviews, students raised issues reflected in the course materials including local project leadership; how identity, privilege and positionality influence relationships and the ability to attain mutual trust; project sustainability; and power dynamics. Undergraduate medical education in global health equity and decoloniality can play an important role in teaching future generations to dismantle the colonialism ingrained in global health and reimagine a global health practice based on equitable partnerships, community needs, and local leadership.

KEYWORDS

global health, decoloniality, colonialism, medical student, undergraduate medical education, scholarly project, equity, coloniality

Introduction: background and rationale for the educational activity innovation

Global health is a field born out of colonialism, i.e., "influence and domination to maintain control over a people or area" (Kohn and Reddy, 2017; Merriam-Webster Dictionary, 2023). By the early 1900's, the British Empire alone colonized 84% of the world's countries (Fisher, 2015). Health care and research was built for the colonizers' benefit; colonized people were provided health care only so as to maximize economic output from their labor, which benefited the colonizers. The legacy of colonialism and related epistemic injustice (e.g., discounting local knowledge and practice and elevating the knowledge of those in power) and racism informed positionality. Positionality denotes dynamic relative status in society (University of British Columbia, CTLT Initiatives, 2024). Positionality can both be given and taken and can operate in multiple ways: people with power bestow power and privilege to others based on socially ranked attributes (e.g., gender, education, income); and a person with relative proximity to power based on how well their identities align with the dominant power structure may not be aware of their positionality. Such complex power dynamics have produced a lack of awareness on how to foster authentic partnerships across institutions and entrenched inequities in research, health care, and patient outcomes (Garba et al., 2021). This history permeates modern-day structure and practice of global health. Yet US medical students may not be aware of this history and how their relative power, privilege, and positionality in the world impact their interactions overseas. Global health engagement from students in Western contexts may perpetuate coloniality by primarily prioritizing the student experience rather than local partners' needs and impacts (Binagwaho et al., 2021). While many medical schools have pre- and post-departure trainings, to our knowledge there are no published curricula in medical schools that promote decoloniality from pedagogy to reflection and action for medical students (Sridhar et al., 2023). To respond to this critical void, and take responsibility for this ongoing injustice, we developed an introductory medical student non-credit course to interrogate the history of colonialism in global health through pedagogical exchange and individual self-reflection as part of students' creation and implementation of scholarly projects. Although born from different historical oppressions, recognizing power, privilege, positionality and systems of oppression that arise from interpersonal and structural root causes, anti-coloniality in global health has intersections with anti-racism education in the US (Daffé et al., 2021; AAMC, 2022). Similarly, education on decoloniality in global health requires students to carry an active and reflective role in dismantling and rebuilding with critical conscience, epistemic justice, and pragmatic solidarity. Epistemic justice refers to giving equal weight to many systems of knowing and generating knowledge, especially from those whose knowledge was and is discounted or seen as having less value. Pragmatic solidarity activating and delivering vital goods and services to those who lack them while also addressing structural issues that result in acute on chronic maldistribution (Farmer, 2008). While there is no single definition of decoloniality (Opara, 2021), for our study we defined it as a verb that encompasses *praxis* - the embodiment of action directed toward formation (Freire, 1970) - to both deconstruct and reconstruct global health engagement to include human rights, ethics, equity, collaboration, respect, and authentic partnership. Local/indigenous wisdom, authority, practice and decision-making capacity are key components (Trembath, 2023). The motivation and intention required to achieve this critical examination is foundational to global health work. Prior to launching a course on the history of and contemporary issues of colonialism and decoloniality in global health, it is imperative to understand students' prior global health experience (breadth and depth), their grasp of power and positionality, and learning goals. This is key to delivering the right content at the right time for optimal engagement and learning. During medical school, students acquire substantive knowledge and skills, develop their identities as physicians, and are offered global health opportunities. As students embark on their careers it is critical that they are introduced to the history of colonialism and its persistent impacts today and acquire techniques to promote decoloniality. The aspirational objective of our pilot course is to help students transform their global health thinking and behaviors and prevent a perpetuation of colonial practice. This study aimed to evaluate the students' understandings of oppression and decolonization at a theoretical level and their ability to reflect on the real world implications of these concepts in their work.

As an author group, we also want to make a collective statement about our own positionality. We are writing this work from elite academic institutions in the US and Africa. We recognize that this gives us proximity to power and therefore yields responsibility for change. We have written this work, and derived this course, as a first step to hold ourselves, our communities and our institutions accountable to continue to right this injustice.

Pedagogical framework(s), pedagogical principles, competencies/standards underlying the educational activity

The pedagogical framework underlying the foundation of this course involved acquisition of theory, reflective practice, and praxis in the field. Three key pedagogical principles were utilized: self-reflection, self-actualization and accountability. In this setting, we define self-actualization through Maslow's framework as "a person being able to fully embody their talents, while also being able to fully verbalize their limitations" (Macleod, 2024).

1. Self-Reflection: The course was anchored to the students' global health scholarly project (GHSP). The students learned by applying course content and frameworks to it. The timing of the sessions was designed to coincide with GHSP deliverables. The reflection questions in the prep work and in-class discussions required meaningful time to contemplate complex concepts of identity and proximity to power.
2. Self-actualization: The course was developed and delivered collaboratively with teaching faculty who lived and trained in historically, and in some cases, ongoing colonized settings in Low or Middle Income Countries (LMIC) to avoid it being solely presented by faculty educated within colonial paradigms. Faculty spoke about their lived experience and

expertise during their teaching. Students were encouraged to discuss what skills they meaningfully used, what limitations they experienced in their skills and collaborations, and how their positionality and proximity to power influenced these.

3. Accountability. The creators of this course, and authors of this paper, feel strongly that we are held accountable for this work, to avoid common pitfalls that allow for performative outcomes. The meta-objective of the course was to create a learning lab of global health participants where students could update one another about their GHSP, share challenges and create space to share emotional experiences and ethical quandaries, strategize solutions, and support each other. The aim of the course creators was to create a safe, brave, and 'ethical space,' just beyond students' zone of comfort and competency, with a goal of optimizing their learning (Vygotsky, 1978; Csikszentmihalyi, 2008). This intentional community also served as an accountability structure to continue to support each other as individuals, collectively as a group, and eventually as an institution, to decolonize (Zinga et al., 2009; Zinga and Styres, 2018; Battiste, 2019).

Methods: course creation, learning environment, learning objectives and pedagogical format

We developed and delivered a five-part pilot course over a 12-month period at Harvard Medical School (HMS) focused on supporting decolonialized learning and action. This was an optional course targeting HMS students engaged in a global health scholarly project (GHSP). Completion of a scholarly project is a graduation requirement, the objectives of which include the following: engage in original scholarly work addressing a question in medicine/public health, using approaches from a range of scientific or social science fields; work closely with a faculty mentor on a scholarly project in a partnership that is mutually beneficial; and inspire curiosity, develop critical thinking skills, and identify analytical tools useful for the future physician-scholar. The GHSP process involves the following steps and deliverables: 1) submit a global health concept and mentor information; 2) submit a five-page proposal that is reviewed by a global health advisory committee member and/or the chair (JK); 3) spend 3–5 months (12 months if taking a 5th year) in a LMIC or indigenous setting in the US; 4) write an article for publication or submit a final report, which is critiqued by the reviewer who critiqued their proposal.

A core group of faculty working in global health were course co-creators and educators. Faculty choice was intentional to include scholars from LMIC settings as well as Harvard-based scholars to help support institutional change. The course was designed over a 6-month period of consensus-building discussions regarding key concepts that were necessary for undergraduate medical students. The course was adapted from a similar curriculum designed for pediatric global health fellows (Sridhar et al., 2023), co-authored by several members of this group. Discussions by course creators focused on the overlapping and disparate role of the medical student as compared to a fellow committed to a global health career. We identified the pieces of the fellows' curriculum that represent foundational knowledge relevant to the student's immediate GHSP and for future growth and development as students consider and potentially embark on a global health career. The group determined that core concepts in decoloniality in global health should coincide with key scholarly project deliverables to ensure that the course extended beyond traditional theory-based curricula. These core concepts included: defining colonialism in global health and as it pertains to student GHSP; ethics of short-term experiences in global health (STEGH); ethics of global health research; and coloniality in the US. All course materials were provided on an internal learning platform (**Figure 1** and **Table 1**). Overall pedagogical framework was informed by critical consciousness raising, which in health profession education is a powerful framework for anti-oppression teaching (Halman et al., 2017).

Course sessions were held while students were in-country at different periods of time and in different time zones. To meet learners' needs, all prep material was available online; students could participate in the sessions in person or via Zoom; and the sessions were recorded for asynchronous learning.

Methods: data collection and analysis

Prior to course launch, students were asked to complete an anonymous survey to assess their baseline ability to apply concepts of power and positionality to their global health work to date; self-efficacy statements ("I feel confident") used 5-point Likert scales that rated responses from strongly agree to strongly disagree. We asked students to describe their previous global health experiences, meaningful moments and concerns that they observed or experienced, definition of colonialism and learning goals for the upcoming year, time available to complete prep work for each seminar; and likelihood of asynchronously completing prep work for missed seminars (4-point Likert scale from extremely unlikely to extremely likely). Students also wrote an essay on how they developed their GHSP and what it means to examine and revise it from a decoloniality perspective. There was significant discussion by this author group on the order and style of questions so that participants would feel safe being open and honest, but also trying to ensure participants did not feel like there was one "right answer" or that they needed to repeat existing literature and academic frameworks.

At course completion, students were asked to complete another anonymous survey that included a course evaluation, the self-efficacy statements, and an assessment of knowledge acquisition and applicability to their GHSP. They also participated in a 30 min one-on-one semi-structured interview. A team member who was not directly involved with teaching or evaluating the course performed and recorded the interviews via Zoom; all students were given the option to use their camera. The interview guide was designed by the research team and included questions about a meaningful and a concerning moment during their GHSP; lessons learned from the seminar series; future careers plans; and how their school can initiate structural change to promote decoloniality and equity in global health. Questions were designed to promote self-reflection and gain deeper insight into the student's recognition

FIGURE 1
Relationship between pilot course topics and students' global health scholarly project deliverables.

of their own dynamic positionality and role(s) in these settings and reflection on their responsibility as students from an elite US academic medical school.

Essays, surveys and interview questions were designed to answer the question "are students using principles of self-reflection, self-actualization and accountability to actively and pragmatically decolonize their [global health] experiences?" The goal of this work, as set forth by this author group, was (and continues to be) to foster growth individually, collectively and institutionally. Therefore, the goals of our pragmatic inquiry were to encourage students to dissect the nuance (and the reality) of this work; continually enhance the course to support change in how students individually consider and implement their work in global health; and ultimately influence collective change. During the seminars, this author group observed the students searching for the "correct answer," a tendency we have witnessed in other academic settings. This type of thinking and institutional culture leads to more concrete thinking, without consideration of context or complexity. For example, many students expressed concerns about themselves or others pursuing global health opportunities in regions of the world that they personally had no connection to. This is evidence of self-reflection; however, it also allows students to avoid the discomfort of further exploring the practical impacts of their disengagement in the process as future practitioners from a high income country and often as those from "colonizing" institutions.

Pre- and post- course survey results were compared. The quantitative analysis was done using basic descriptive statistics in excel, and open-ended answers were analyzed with content analysis and components of relational analysis. Themes were denoted at the level of sentences and phrases rather than word or word-pairing. As concepts emerged, concept frequency was coded.

Pre-course essays were redacted by a team member who was not involved in the analysis. The interviews were transcribed and redacted with the same process. Two independent reviewers analyzed the redacted essays and interview transcriptions using open codes with a grounded theory and thematic approach. A combination of inductive and deductive coding was employed. Both reviewers reached saturation after reviewing approximately 70% of the essays and interviews. A code book was generated and reviewed by a third reviewer to break any ties. Each essay and interview was re-reviewed by both reviewers using the agreed upon code book. After all of the data had been coded, codes were categorized into themes, which were then categorized into concepts and assertions.

General themes were considered with quantitative findings to describe the students' progression through the curriculum. Our study was reviewed by the HMS Program in Medical Education's Educational Scholarship Review Committee and was exempted from IRB review.

Results

All students who planned to engage in a GHSP were invited to participate in the course ($N = 14$). Ten enrolled and seven attended at least one session. Four were ineligible because they did not complete a GHSP. We focused our analysis on five students who

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TABLE 1 Description of the pilot course sessions and key GHSP deliverables.

Session	Learning objectives	Preparatory materials	GHSP deliverable
Beyond Colonialism: What does this mean and how does it inform your global health scholarly project?	•Acknowledge historical colonization and how it has shaped our view of global health •Interrogate key terms in global health •Personally reflect on our roles as colonizers in this field •Strategize how to dismantle and re-imagine the practice of global health both in our personal and advocacy work •Examine and restructure your global health scholarly project from an anti-colonial perspective	•Complete pre-course, anonymous survey before doing the prep work: •Write a 1-page essay on how you developed the concept for your global health scholarly project, and what it means to you to examine and structure your global health scholarly project from an anti-colonial perspective. •Listen to podcast Social Medicine on Air, "Decolonizing Global Health," an interview among co-hosts Dr. Jonas Attilus, Dr. Brendan Johnson and guest Dr. Laura Mkumba. • Review list of key terms and definitions.	Submit concept of global health project and mentor agreement.
Short-Term Experiences in Global Health (STEGH): Principles to Maximize Benefit and Minimize Harm (two sessions)	• Understand the potential benefits and harms of short-term engagements in global health (STEGH) •Apply STEGH guidelines and frameworks to your global health scholarly project •Appraise the impact of STEGH on key stakeholders •Evaluate future global health endeavors using STEGH principles	•Watch videotaped conversation in Ghana between Dr. Sheila Owusu and Dr. Leah Ratner: https://www.youtube.com/watch?v = rKyw5w5a9XM. Note what Dr Owusu says about sub-optimal and optimal engagement in global health by people from other countries. What does she say about culture? What did she learn about people from other countries working in hers that surprised her? •Complete the Global Ambassadors for Patient Safety online workshop: https://healthcareers.umn.edu/courses-and-events/online-workshops/global-ambassadors-patient-safety •Reflection questions	Submit a 5-page proposal that is critiqued by HMS OSE global health advisory committee members. Students spend time in-country working on their GHSP.
Neocolonialism in Contemporary Global Health Research and Practical Strategies to Avert it	•Describe how neocolonialism manifests in global health research today. •Articulate broad and specific strategies they can champion to counter colonialism in global health research.	•Listen to podcast: Global Health Unfiltered! Dissecting the foreign gaze in global health with Seye Abimbola. https://globalhealthunfiltered.buzzsprout.com/1915165/10767011-dissecting-the-foreign-gaze-in-global-health-with-seye-abimbola •Read Jumbam DT. How (not) to write about global health. BMJ Glob Health. 2020 Jul;5(7):e003164. doi: 10.1136/bmjgh-2020-003164. https://gh.bmj.com/content/5/7/e003164.long •Read Liwanag HJ, Rhule E. Dialogical reflexivity toward collective action to transform global health. BMJ Glob Health. 2021 Aug;6(8):e006825. doi: 10.1136/bmjgh-2021-006825. https://gh.bmj.com/content/6/8/e006825.abstract •Reflection questions	Students write manuscripts for publication or GHSP reports.
Countering Coloniality in the United States: the example of indigenous communities using traditional healing practices to address mental health concerns in American Indians	•Understand history and contemporary practices of coloniality of indigenous peoples in the United States •Explain the (post) colonial predicament for delivering community-based mental health services for American Indians •Discuss characteristics of an alternative Indigenous framework for mental health concerns •Reflect on how this seminar series informed your global health scholarly project and future global health career	•Read "I came to tell you of my life:" Narrative Expositions of Mental Health in an American Indian Community by Prof Gone •Listen to podcast: https://podcasts.apple.com/ie/podcast/joseph-gone-when-healing-looks-like-justice/id1212789850?i = 1000453966021 •Reflection Questions	Final critique of GHSP report by same reviewer of the student's proposal. Students have an opportunity to apply for honors in a special field (defense of a thesis and recognition at graduation).

completed our pilot course and their global health scholarly project. All of them completed the pre-course survey, post-course survey, and post-course interview; four completed the pre-course essay.

Pre- and post-course survey results

Prior to medical school, these five students had 13 distinct experiences in a mix of rural and urban low and middle income and indigenous settings in 12 countries. Their reported global experiences included working in community, health care, research, and public health. Their time overseas varied: six of their experiences were less than 2 months; three were two-twelve months; and four were greater than 12 months. Activities they were engaged in included water contamination, people with disabilities, maternal and child health, mental health, COVID19, nutrition, and indigenous peoples.

Prior to the course, responses to the self-efficacy survey highlighted that students felt most confident in their ability to build relationships with global partners that facilitated understanding of needs, values, and preferences of people in different contexts. They also expressed confidence in their knowledge of colonialism and its impact on their GHSP; planning their GHSP in collaboration with local partners and aligned with local priorities, with an awareness of who is setting the agenda and which perspectives are missing; evaluating the ethical strengths and weaknesses, and the influence of language and communication on their GHSP; their relative power and positionality, ability to advocate for the inclusion of marginalized voices in decision-making, and working with and accepting ethical and cultural differences. They were less confident in their ability to ensure research projects were bidirectional and promoted local leadership and priority-setting; describe the historical forces that influence current power dynamics in global health financing; and how to utilize multiple advocacy approaches to advocate for social change (**Graph 1**).

The self-efficacy surveys conducted after course completion indicated that there was a general trend toward increased self-confidence across all domains. The greatest increase in self-confidence occurred in students' ability to promote bidirectional research; effectively teach; understand the historical and present influences on global health financing; and advocate for social change (**Graph 1**).

Duration of time in-country did not correlate with confidence levels in any domains. Among goals for the course, students named seeking mentors for global health career development, centering local priorities and control of research with bidirectional partnerships, learning about the influence of colonialism on global health, and supporting indigenous activities to promote decolonization.

Pre-course essay results

Students' pre-course essays (N = 4) highlighted three key themes: current existing colonial practices, working toward anti-colonial practice, and aspirational goals (**Table 2**).

When discussing prior meaningful moments during their pre-medical global health engagement, the students mostly focused on something they gained from their work (e.g., knowledge, new perspectives, writing skills), and two also spoke about collaborating with a local NGO, and working in the background to amplify the voices of the local colleagues. One student discussed the contemporary, lingering effects of colonization. When asked about moments that raised concerns, the students named asymmetry in resources (e.g., financial, skill building). One student identified the exclusion of local people from conversations and agenda setting. In their definition of colonialism, the students wrote about influence or control of one group over another. Three students spoke about the extractive nature of colonialism, and two students discussed contemporary ramifications of historical practices.

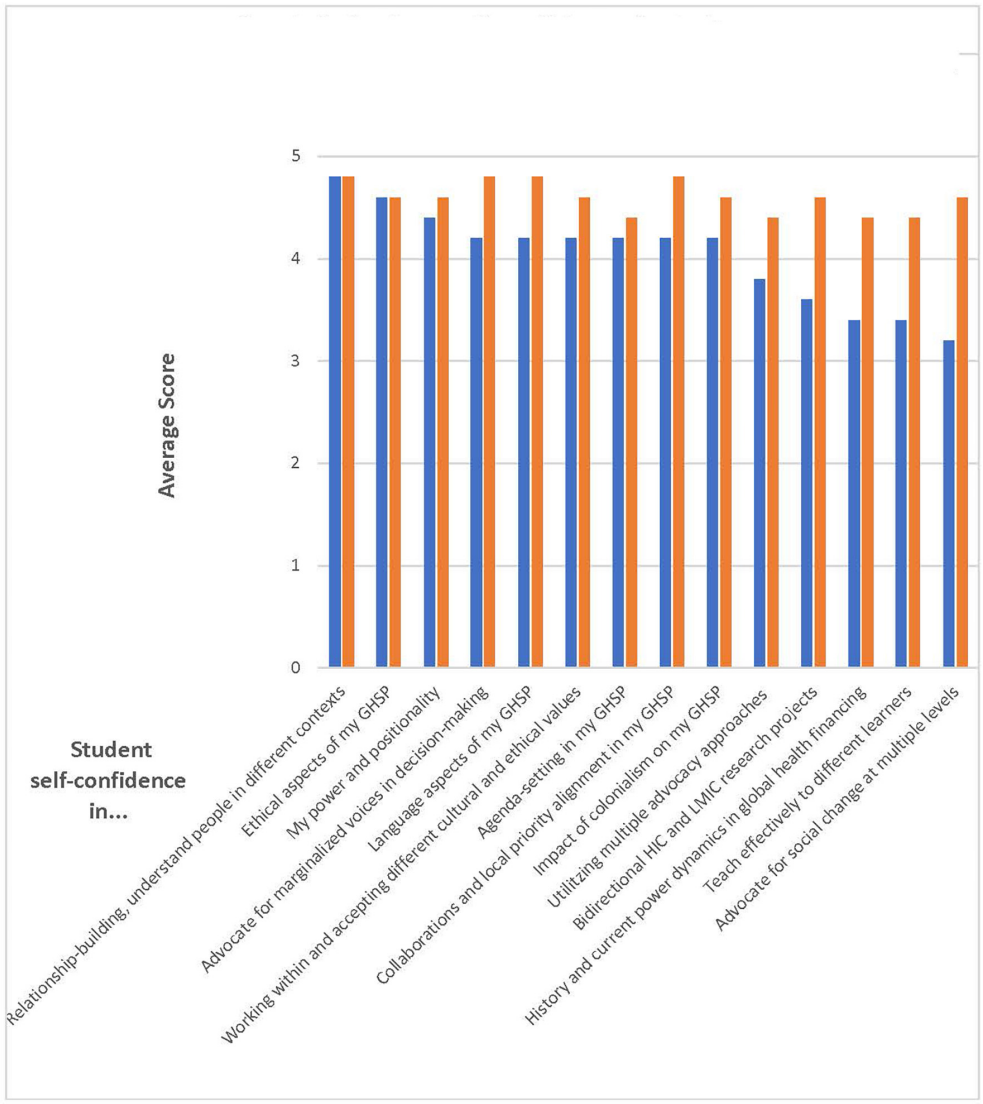
Post-course interview results

Nearly every student reported completing at least some of the pre-session prep material, but no one reported completing all of it for all five sessions; there was a trend in less preparation for the final two sessions. There was a mix of in-person and virtual participation; similar to preparation, there was less attendance at the last two sessions. On average, the students found the course content very relevant to their GHSP. Students did not report that voices were marginalized or that the course lacked diversity and inclusivity or conveyed bias. Three students agreed or strongly agreed that the course met their learning goals, which included understanding decoloniality work as a process, building community, engaging in critical discourse, and gaining perspective on how to view their role as an outsider. Based on theory discussed during coursework, students reported witnessing deference to local leaders to determine project utility, aims and priorities; how their privilege and identity are at play when connecting with local communities and attempting to build mutual trust; balancing personal obligations and sustainability; and how power dynamics played out in funding (e.g., less opportunities for non-US-based people to travel), partnerships (e.g., government presence), authorship, and project-specific decisions (e.g., non-US people had less voice). Students recommended that future course iterations continue to involve global faculty speakers, STEGH cases and frameworks, and ongoing discussions of individual student's GHSP.

Similar to the post-survey findings, key themes that emerged in the post-course interview included relational reflections, role reflection, the translation of decolonial theory into personal practice, questioning the bigger picture (and meaning) in this work and a sense of individuality. Emergent themes were categorized and meaningful quotes were re-reviewed to ensure they were representative of the themes (**Table 3**). These themes were slightly different from the pre-course findings focused on aspirational goals, indicating that the course did push students to consider the more practical implications of their work.

Discussion on the practical implications, objectives and lessons learned

Our findings indicate that the first step in promoting decolonized ideals in global health education for medical students



GRAPH 1
Student self-confidence in their ability to apply concepts of power and positionality to their global health work to date (N = 5). Scale: 1 = strongly disagree, 2 = somewhat disagree, 3 = neutral/no opinion, 4 = somewhat agree, 5 = strongly agree.

is to create a learning environment that supports genuine reflective transformational learning. We look to indigenous scholar and thinker, Willie Ermine, on the creation of an ethical space: "An ethical space is not something that is tangible, rather, it is an acknowledgment of a metaphorical 'space' that exists between beings through which differing worldviews can interact in authentically (Ermine, 2007)." From our experience, this requires shedding light on the historical power imbalances and oppression that have shaped present-day global health; the students' relative power and positionality in that world; and how student deliverables do not necessarily follow the same timeline as the Global South or promote the incorporation of community needs and local leadership. To do this requires accountability, authenticity, and vulnerability on the part of the teachers to model and support ethical space creation.

It is worth noting that the quantitative statements around confidence both started and ended at a rather high level, converging with emergent themes around individuality. This illustrates the notion (and the harm that can come from) one's personal reflection without accountability. Although students may feel confident, they may have unrecognized and unchecked biases based on their own lived experiences (Wong et al., 2021). Therefore, there must be accountability in their GHSPs to ensure that they are not only learning theory, but also truly engaging in reflective practices and praxis. During their exit interviews, genuine and intentional collectivism and building of collaborations were lacking in most of their comments about their GHSP. Research topics were chosen, in some cases, before engagement with the community and did not always involve the community members or prioritize the needs of the community (Noor, 2022). Our course must ensure that students do not pay lip service to decoloniality or resort to tokenism, but rather that they are truly moving toward a collective unity in practice (wa Thiong'o, 1994). Our course needs to push students to identify their own biases and where they can

TABLE 2 Themes and notable quotes from pre-course essays (N = 4).

Theme	Description	Notable quotes
Current existing colonial practices	Students spoke about *their* project, *their* findings, individual ownership	*"I developed the idea for my scholarly project in an effort to finish up a research project that I began in [country, redacted for privacy], during my gap year between undergrad and medical school."* *"My project seeks to explore [redacted].My current plan is to use existing [redacted] data from the last 5–10 years. However, depending on the course of the research, I hope that there may be a component of in-country work at some point, such as the implementation of a mixed quantitative-qualitative methods research study of [redacted]. . ..I came to this project because I was interested in pursuing research that related to global health and combined the medical and surgical care of children."* *"From an optimistic point of view, my research does feel important, and nobody has conducted a project with my same objectives before."*
Working toward anti-colonial practice	Students discussed aspects of language, language from an indigenous perspective Students had nascent thoughts about anticolonial concepts before the course They described the importance of relationship building, long-term collaborations and context-specific research/work A few spoke of local priority setting, power-dynamics and questioning their role and their practice A couple mentioned a local mentor and the importance of a local mentor	*"Indigenous languages are a connection between traditional ecological knowledge, biodiversity, planetary protection, and Indigenous community health that the global medical community has long overlooked. . . It felt like a momentous and progressive step for academia in moving toward understanding the rights of Indigenous Peoples, including Native students, around language, especially since [redacted] and all other Indigenous Nations in the U.S. still suffer from past and ongoing colonization."* *"When I started my global health work several years back, I had very little understanding of anti-colonialism. I went to [country] with little grasp on what I would be doing there and was very naive on how, why, and what I could contribute. Fortunately, I became very close with the medical director. . .the only tertiary hospital in the Northern Region. I spent several weeks learning from him and from his strong mentorship, an abstract idea of anti-colonialism formed in my head. I was unable to define it, but I recognized that for some reason that I did not understand, my previous perception of global health was completely wrong."* *"While I have tried to approach the planning of my project from an anti-colonial perspective, I recognize that the premise of my project will forever be inherently colonial. As a white American. . .who does not identify as having [redacted], I have tried to examine and question my identity and its impact at various points during my field work and now as I hope to return next year."* *"Something that I have been working on is how to adapt the methodology to meet the unique cultural and socioeconomic context of [country] and recognize that this must stem from forging a strong and equitable partnership with those locally vested in the work."* *"my [country]supervisor. . .immediately made it clear that my original project on [redacted] would not be reproducible in [country], as there were no active local studies on the topic nor capacity to start one. Instead, he emphasized that a more appropriate role for me would be helping with the team's top priority: responding to the ongoing COVID-19 pandemic, which had just devastated [country] during a surge of the Delta variant. . .I agreed. . .shifting my focus for the year to advocacy around COVID-19 vaccine access."* *"However, I cannot help but ask: Should this project be performed by someone who is [local, redacted]? How can my work benefit a local audience? In what ways can my identity negatively impact the work that I am doing? As I design and plan this second stage of my project, I have tried to mitigate all of these potential downsides to my performing this work."* *"Lastly, I am wrestling with the reality that this research does, in fact, benefit me in my academic and professional pursuits. I have recognized that this dynamic can create a neocolonial structure when it comes to global health work."*

(Continued)

TABLE 2 (Continued)

Theme	Description	Notable quotes
Aspirational goals	Students wrote about aspirational, albeit vague, goals (e.g., relationship building, equity) for anti-colonial practice	*"Looking forward to my year to come, I hope that my involvement centers on locally-driven goals and is aimed at the benefit of the community I'm serving rather than the benefit of my career. I hope this course can help me strive for that ideal and not slip into patterns of colonialistic global health."* *"While I am thankful that my Scholarly Project was specifically identified as a priority by my [country] mentors (versus a priority for me alone with little interest or value locally), I am trying to remind myself to think about power and privilege at all upcoming stages of the research. This includes during study launch meetings (how much am I speaking versus listening?), during data collection (how much am I inconveniencing vaccination staff members as I try to collect data from vaccination sites? How can I minimize those disruptions? How will I answer honestly if asked how this project will benefit local communities?), during data analysis (do my data analysis choices portray a certain story about these communities?), and during write-up and submission for publication (whose voices are represented in a paper, and is that representation fair? who takes credit for this project?)."* *"I hope to collaborate with others during this seminar and with trusted mentors to help me retain the grassroots essence of my project without feeling pressured to "produce" for the sake of residency applications to the point of losing the collaborative nature of my project."*

make improvements. To accomplish this, we must create ethical spaces informed by collective vulnerability, humility, curiosity, and ultimately accountability (Wilson, 2022).

We learned key lessons regarding course feasibility. Although our bias is that in-person participation ignites the greatest engagement, sharing, and learning, having a virtual option and making the materials available for asynchronous learning optimizes opportunities for learning. Student participation and guest lectures via Zoom enriched, rather than detracted, from the conversation. However, despite accessibility to the course and its materials, participation waned over time. This could be a product of the optional nature of the course and the asynchronous component; varying times zones; suboptimal internet bandwidth in-country; and a lack of cohesion and accountability among the student cohort. Students who were overseas for the last two sessions of the course said they could not participate because of the difference in time zones. Furthermore, it may be that competing priorities increased toward the end of the academic year. This coming year the course will be a required component of the GHSP, so we will develop tools for greater accountability. We will plan regular check-ins with students and require written reflections for asynchronous learning as a way to evaluate engagement with the topics and provide course credit. Another goal is to create an ongoing global health learning lab whereby we foster more interactions, communication, and cohesion among the students both inside and outside the course. We were fortunate to have teaching faculty who lived and trained in historically and ongoing colonized settings to educate the students. Students said we should invite them to speak at future course iterations. We recognize that this can be an extra burden on these teaching faculty. We must continue active discussions about whether and how they would like to continue teaching the course and to compensate them for their time and expertise.

There are a number of limitations to our study. Our small sample size does not allow us to draw meaningful conclusions about the potential broader impact of this course. But our findings suggest that students felt this was a valuable experience that met their learning objectives and enhanced their understanding, knowledge and efficacy in global health equity. Our study may have had selection bias: the students in this pilot course chose to participate knowing the topic and therefore may represent a group that is more knowledgeable about, more confident in, and committed to promoting decoloniality and equity in global health. As we look to expand the audience, first to all students conducting a GHSP, and eventually to all medical students engaged in any global health activity, it will be important to assess whether it has a similar impact and effectiveness. Finally, we do not know how knowledge and ability to discuss key concepts in global health decoloniality correlate with and translate into true decolonial praxis in global health (Ratner et al., 2022). It will be important to develop metrics to not only assess student knowledge, insight, and understanding but also how the course impacts decoloniality behaviors and practices by students in the field.

As we embark on teaching decoloniality and global health equity to medical students, it is critical that we examine how we simultaneously educate faculty and hold them accountable to equitable global health engagement. In addition, the structures in place, especially within our own institutions, may serve as barriers to true praxis in decoloniality (Eichbaum et al., 2021). Time constraints and educational requirements impact both scholarly projects and away rotations in ways that may work against local control and equitable partnerships based on community needs. Student evaluations by faculty, residency application criteria, grant funding criteria, and academic promotion policies often favor academic skills and work products over true bidirectional partnerships promoting local leadership and community involvement in global health. As we educate students on these issues we must also advocate for dismantling systems that promote coloniality and instead incentivize decolonial

TABLE 3 Emergent themes, sub-themes and notable quotes from exit interviews (N = 5).

Themes	Sub-Themes	Notable quotes
Relational *(the impact of relationships in recognizing colonial structures)*	**Collectivism** *(bringing people together, collective, support)* **Community** *(students feeling personally supported by community)*	*"I feel like a lot of it was just like how valuable it is to have community around discussing these issues and how it's necessary to be vulnerable about our past failings and in kind of complicity in these colonial structures. I think just having kind of really open discussion among well intended people, socially critical, intellectually critical people, who together kind of could reflect, not in not to kind of sedate those concerns right, but to recognize and kind of have some strength and solidarity in."*
Role Reflection *(reflecting on personal roles and their perpetuation or accountability in colonial structures)*	**Vulnerability** *(sharing mistakes, discomfort and personal growth)*	*"I know that there are things that I would have done differently going back."* *"You know it's necessary to be vulnerable about our past failings and in kind of complicity in these colonial structures, and I think that that's something that gives me a lot of angst."*
Theory to Practice *(reflecting on the tension in understanding the academic realm of decoloniality and having to put it into actionable change during global health rotations)*	**Navigating layered tensions** *(multifactorial tensions named that are likely comprising cultural, systemic, structural and hierarchical issues that the student is grappling with)* **Moral tensions around unclear path forward** *(because of these tensions student is reflecting on how not to be colonial but has moral quandary)*	*"I think when I hear decolonization, I think of things like money, resources, land– the things that colonialism took away from people– are actually being returned to those people and I don't feel like that from the [academic] papers that I read, like I don't feel like it really went that far."* *"I still feel like there's some kind of dubiousness to it. it's about a kind of redistribution of wealth, right? This is money that we've raked in from [a] colonizing past. I mean in case of Country 1, much of the poverty there is explained by [redacted] colonialism and economic systems that persist [to] perpetuate that. And so, taking philanthropist money and having a good way to bring that back to supporting Country 1. It's not any one thing, but I you know I kind of reflect a bit on how I feel about that. . ."*
Questioning the bigger picture *(exploring moral quandaries of the uncomfortable juxtaposition of being part of a system that perpetuates inequity but wanting to be part of dismantling it, student reflecting on their role in this work in the future)*	**Questioning my role (now and in the future)** *(building on these experiences, student questioning the role of academics, HMS specifically, and how they fit into perpetuating or dismantling colonialism and what that means for their roles)*	*"I think the power structures outside of just HMS and like medical involvement is there. So I think, just naturally a medical student being involved kind of gets sucked into that that structure. I think this [course] is a good way to start. At least the medical student themselves can recognize and see it."*
Individuality *(reflections that don't intersect with broader systems of power such as community, systems and structures, but rather focus only on the student's individual impact)*	**Individual Impact** *(focus on individual achievement, their individual "impact" on communities or how they alone may contribute to a project/community)*	*"When I was leaving Country 1, the medical unit and the multidisciplinary medical group joined for dinner. Before we ate, one person like, individually, each one would get up and say like a tidbit about their time with me, and how they appreciated that and everything around that, and then they would present a gift, and it was really meaningful just to see, like over [my time there] what kind of impact I could make in their lives, personally."*

global health practices (Besson, 2021). Without this, the "hidden curriculum" promoting US control of global health efforts will work against the teachings of this course.

Our generation has inherited a global health practice born out of colonialism. It is our responsibility to dismantle this colonial legacy and the inherent conceptions and biases in both ourselves and our learners so that we do not continue to pass it on to future generations. We hope that this course serves as a first step in teaching our future physicians the foundations of dismantling colonialism and replacing it with a new global health praxis based on respectful partnerships, local leadership and community needs (Farmer et al., 2013). With continued refinement based on learnings and feedback and an assessment of the curriculum's efficacy, we hope that this can serve as a model for introducing medical students to decoloniality so that they authentically walk the walk as they talk the talk.

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We want to acknowledge that as an author group we are all committed to our personal ongoing journeys in decolonizing, and we have a long way to go. This work was conceptualized through our own epistemic understanding of this injustice, and fails to bring in other ways of knowing. We recognize that the completion of a course, or an essay, may support one's journey to understanding this work, but does not indicate it is done. We invite feedback, critiques and further guidance from others on how to continue to hold ourselves and our institutions accountable. Lastly we also acknowledge that writing about decolonizing global health is not

enough. We must continue to embody its principles every day, in every action. This paper is just the beginning.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Author contributions

JK: Conceptualization, Formal analysis, Investigation, Methodology, Project administration, Supervision, Writing – original draft, Writing – review and editing. LR: Formal analysis, Investigation, Methodology, Resources, Writing – review and editing. SS: Formal analysis, Investigation, Methodology, Resources, Writing – review and editing. SR: Investigation, Methodology, Resources, Writing – review and editing. RM: Formal analysis, Investigation, Methodology, Writing – review and editing. SO: Resources, Supervision, Validation, Writing – review and editing.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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A proposed guide to reducing bias and improving assessments of decolonization in global health research

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Introduction: The movement to decolonize global health encompasses efforts to dismantle historically inequitable structures and processes in global health research, education, and practice. However, despite increasing literature on the decolonization of global health, gaps between action and knowledge exist in assessments of knowledge production. In this Perspective, we will outline potential biases in current approaches to assessing knowledge production and propose a systems-focused guide to improve the interrogation of knowledge production in this field.

Methods: We leverage the "Inner Setting" and "Outer Setting" domains of the Consolidated Framework for Implementation Research (CFIR), a well-established, commonly-used implementation science framework to critically assess the status quo of decolonization and to develop criteria to help guide decolonization efforts in academic contexts. We defined the Inner Setting as academic and research institutions leading and participating in global health research collaborations, and the Outer Setting as the funding, editorial, and peer review policies and practices that influence knowledge production in global health. Research institutions in the Inner organizational domain continually interact with the Outer policy domains. We categorize the levels at which decolonization may occur and where action should be focused as follows: (1) North–South, (2) South–South, (3) Local South, and (4) Local North. Using CFIR domains and the levels of action for decolonization, we propose a multi-level guide to improve on the standardization, granularity, and accuracy of decolonization assessments in global health research.

Conclusion and expected impact: The proposed guide is informed by our global health research expertise and experiences as African scientists with extensive exposure in both global North and global South research contexts. We expect that the proposed guide will help to identify and address the biases identified and will lead to better knowledge-driven action in the process of decolonizing global health research.

KEYWORDS

decolonization, white supremacy, equity, global health, research, education, implementation, implementation science

Introduction

The movement to decolonize global health encompasses efforts to dismantle historically inequitable structures and processes in global health education, research, and practice. Racism, white supremacy, and the marginalization of global majority populations through historical structures of oppression such as colonialism and neocolonialism, are entrenched in global health in its current form. As a result, global health ontology (the realities and study of being) and epistemology (the creation and study of knowledge) from the global South have been at the periphery (Abimbola, 2023). The decolonization movement aims to confront global health's colonial and white supremacist roots; undo the idea that progress in global health is unidirectional, from the "donor" in the global North to the "beneficiary" in the global South (Abimbola, 2019; Abimbola et al., 2021; Khan et al., 2022); and extend influence over global health beyond Western institutions to global majority settings (Erondu et al., 2020; Pai, 2020). Efforts to decolonize global health have become increasingly prominent since the term was used in seminal articles and catalyzed by the "#decolonizeglobalhealth" social media campaign starting in 2019 (Guinto, 2019). According to Waziyatawin and Yellow (2005), "[d]ecolonization is the intelligent, calculated, and active resistance to the forces of colonialism that perpetuate the subjugation and/or exploitation of our mind, bodies, and lands…" and extends to diet and other aspects of health (Waziyatawin and Yellow, 2005). Publication of field-shifting papers by authors in both the global North and South have lent further strength and evidence to these efforts (Boum Ii et al., 2018; Iyer, 2018; The Lancet Global Health, 2018, 2021; Abimbola and Pai, 2020; Erondu et al., 2020; Pai, 2020; Araújo et al., 2021; Daffé et al., 2021; Pant et al., 2022).

Research has been a particular focus of the decolonization movement's scrutiny, reflecting its foundational role in creating global health knowledge and shaping global health ethics, education, policy, and practice. Understanding the assumptions and values that underlie research is a part of the decolonization process (Smith, 2012). As is the case in other disciplines, research endeavors in global health require a stepwise series of tasks. These include prioritizing and developing consensus on research topics, identifying collaborators, securing funding, conducting research, and disseminating findings through avenues such as conference presentations and journal publications.

This stepwise process provides ample opportunity to adopt decolonized approaches. Despite an abundance of literature on the need for decolonization, only nascent guidance has been published on specific steps toward achieving this goal (Walters and Simoni, 2009; Khan et al., 2021; Narasimhan and Chandanabhumma, 2021). This allows for bias (systematic inequity) and ambiguity (systematic uncertainty) in actualizing decolonization and perpetuates the status quo. For example, editors may use author names and institutional affiliations to assess researchers' connections to study settings, leading to misattribution of ethnicity or location due to name and belief biases (Farnbach et al., 2017; Boum Ii et al., 2018; Babyar, 2019; Hudson et al., 2020; The Lancet Global Health, 2021; Patterson et al., 2022). It may also lead to arbitrary quotas for how many authors should be from a specific place or group, rather than addressing underlying practices that would further true inclusivity and belonging. This situation occurs alongside a push to practice vigilance and reflexivity (statements of inclusivity and author identity) in decolonization to ensure that it moves beyond rhetoric and that its outcomes are structural and (Rennie et al., 1997; Yousefi-Nooraie et al., 2006; Matías-Guiu and García-Ramos, 2011; Chersich et al., 2016; Hedt-Gauthier et al., 2019; Mbaye et al., 2019; Rees et al., 2021, 2023; Akudinobi and Kilmarx, 2022).

In recent years, bright spots in academia that have emerged as counters to systemic inequity from colonization include the following: in 2010, the US National Institutes of Health (NIH) funded foreign institutions specifically located in African countries through the Medical Education Partnership Initiative (MEPI) (Fogarty International Center, 2020a). Outcomes included more than 1,000 manuscripts and more than 500 grant and fellowship applications, with a success rate of 34% or 187 awards (Fogarty International Center, 2020b). In 2021, the PLOS GPH journal was launched with the express mission detailed by editors Kyobutungi, Pai and Robinson as having a focus on inclusion and "amplifying the voices of underrepresented and historically excluded communities." They committed to being "deliberate and intentional about equity, diversity, and inclusion at all levels–editors, editorial boards, peer reviewers and authors–" to broaden the range and diversity of perspectives. As a result, they recruited a majority of section editors that were women, and Black, Indigenous and people of color (BIPOC); half of the section editors are based in the Global South (Kyobutungi et al., 2021). Other global journal efforts include waiving of publication fees for authors affiliated with LMIC-based institutions and providing editing services in some cases. Additionally, the Fogarty Emerging Leader Award was launched a few years ago and is sequestered for LMIC candidates; applicants are provided with "research support and protected time, (and must hold) an academic junior faculty position or research scientist appointment at an LMIC academic or research institution." These initiatives and their subsequent impacts have been noteworthy, however, the incidence of such examples among funding bodies, journals and other academic gatekeepers is rare. To facilitate structural change, we propose the development and application of frameworks for assessing measurable indicators in the decolonization process.

In this perspective, we highlight measures to guide standardized assessments of systems-level decolonization in global health research. These measures are informed by our personal experiences as African scientists, common observations in the global health field, and the nascent literature around decolonization in research. We make particular note of the challenges and potential biases that may arise from using some of the current approaches to assessing decolonization in global health research, and discuss how our proposed measures may assist authors, research institutions, publishing entities, and funding bodies to avoid these biases.

Conceptualization of the guide

We describe potentially problematic measures of equity, representation, and inclusion currently used to assess decolonization in global health research (Table 1) and the risk of bias associated with each, drawing from key literature where available. For our assessment, we used a well-established implementation science framework, the Consolidated Framework for Implementation Research (CFIR) (Means et al., 2020; CFIR, 2022; Damschroder et al., 2022) The CFIR, and implementation science overall, provide a systematic approach to evaluate programs, processes or interventions – a "thing" – with a given purpose. The CFIR framework consists of five different domains

TABLE 1 Proposed measures for assessing decolonization in global health research.

Common factors used as indicators of equity, representation and inclusion in global health research	Potential for bias/type of bias	Practical challenges	Suggestions for improvement ("Inner Setting")	Suggestions for improvement ("Outer Setting")
First, last or a majority of author names originate from resource-limited contexts	Name bias; Belief bias	✦Difficult to ascribe author origin based on names alone ✦Names, even if originating from a resource-limited context, may belie author affiliations and access to resources outside of that context (and vice versa) ✦Individual assessments of identity rely on reviewer assumptions, creating risk for bias, erroneous perceptions and misguided practice	**Global North–South/ Local Global North:** ✦Academic/ research institutions provide sensitization on the limitations of names/ institutions as indicators for author identity and connections to research contexts for all affiliated scholars (administrators, faculty and trainees) e.g. through lectures, workshops, on-boarding, or as a supplement to other required training for scholars engaging in research (supplement to mandatory ethics training, CITI training) etc. ✦Institutions design, evaluate, validate and implement frameworks for evaluation of equity in outputs beyond names	**Global North–South/ Local Global North:** ✦Funding, editorial and peer review bodies provide training against the use of name and institution as indicators of author identity for all editors, editorial board members and reviewers as part of onboarding ✦Journal leadership develop more nuanced frameworks for evaluating author identity based in explicit author statements about connection to contexts of study ✦Funding, editorial and peer review bodies implement and enforce clear guidelines for all submissions around reporting institutional affiliations that help mitigate effects of bias such as enforcing listing of all institutional affiliations - that may better reflect actual access to resources and provide an opportunity through reflexivity statements for authors to identify how many authors are from the host country or region and whether this includes the first or last author ✦Funding, editorial and peer review bodies mandate reflexivity statements in all academic outputs (e.g. grant or manuscript cover letters detailing author connection to contexts of study) that ensures authors describe research team contributions and explanation of authorship order
First, last or a majority of author institutions based in resource-limited contexts	Name bias; Belief bias	✦Named institutions may not necessarily represent authors' primary institutions, comprehensive institutional affiliations and types of access that various affiliations may confer ✦Individual-based assessments left to discretion of editors, reviewers and other agents creates risk for bias, erroneous perceptions of researchers' identities and institutional access		

(Continued)

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TABLE 1 (Continued)

Common factors used as indicators of equity, representation and inclusion in global health research	Potential for bias/type of bias	Practical challenges	Suggestions for improvement ("Inner Setting")	Suggestions for improvement ("Outer Setting")
Partnership between researchers in High-Income and Resource-Limited Contexts	Context-dependent inequities in power	✦Limited means for assessing the content or quality of research partnerships, and the extent to which partners in low-resource contexts are engaged in critical aspects of research, such as goal-setting, interpretation, implementation and publications ✦Limited supports for developing and sustaining equitable global collaborations; this may act as a deterrent and promote shortcuts that are either less inclusive or frankly unethical in establishing partnerships	**Global North–South/ Local Global North:** ✦Authors and academic institutions enforce ICJME guidelines for manuscript writing to allow appropriate responsibility and recognition to all research partners ✦Institutions reward endeavors that prioritize equitable partnership (e.g., Global North promotion processes that account for collaboration with Global South partners) ✦Institutions use and dislose memoranda of understanding, and other formal agreements around terms of partnership in global health research to allow greater transparency and accountability in these partnerships ✦Institutions provide processes to report instances of conflict, inequitable partnerships and abuses of power in global health partnerships, e.g., through appointment of an ombudsperson for confidential reporting and advising **Global South–South/ Local Global South:** ✦Institutions provide sensitization around the importance of South–South collaboration as a means to enact declonization in global health ✦Institutions provide opportunities for South–South collaboration, e.g., through regional conferences and funding mechanisms ✦Institutions reward endeavors that model South-South partnership e.g. promotions processes that support collaboration with other global South actors	**Global North–South/ Local Global North:** ✦Funding, editorial and peer review bodies implement and enforce clear statements on research contributions in academic outputs to promote equitable practices e.g. as part of journal mission, incorporating evaluation criteria for editors and reviewers to interrogate evidence of partnership in research submissions ✦Funding, editorial and peer review bodies provide sensitization and training on the need to critically assess research partnerships as they reflect equity in global health research for all reviewers ✦Funding, editorial and peer review bodies support calls, special series and dedicated funding for activities, events and programs to promote equitable partnership, e.g., through dedicated calls featuring work led by Global South scholars or that demonstrate innovation in Global South or indigenous led project implementation ✦Funding, editorial and peer review bodies support the design and implementation of frameworks for evaluating equity in global health outputs such as through funding and publication issue calls **Global South–South/ Local Global South:** ✦LMIC academics, societies, and organizing bodies "lean in" and assert their vital roles in research ✦LMIC organizations implement an expert "officer", set of "officers", or governing body that advocates for their collective role in global health research, and helps to enforce and inform best practices on collaboration in global health

(Continued)

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TABLE 1 (Continued)

Common factors used as indicators of equity, representation and inclusion in global health research	Potential for bias/type of bias	Practical challenges	Suggestions for improvement ("Inner Setting")	Suggestions for improvement ("Outer Setting")
Standard American or British English required for journal publication and funding application	Attribution Bias	✦This practice inappropriately equates proficiency with these forms of English with research knowledge and abiltity, disregarding research in contexts outside those where English is not the primary language, and those where access to English-language editing services may be limited	**All Levels:** ✦Funding, editorial and peer review bodies fund and support primary language submission processes, and for services to translate global health outputs between languages ✦Funding, editorial and peer review bodies promote and reward submissions in primary local languages (eg. through special calls and discounted submission costs) ✦Funding, editorial and peer review bodies provide access to academic writing services, workshops or trainings at scaled pricing, or freely, as is possible	**All Levels:** ✦Authors and institutions advocate locally, nationally and internationally for submissions in primary language and for services to translate global health outputs between languages ✦Institutions and organizations promote and reward academic events in primary local languages, e.g., through institutional meetings and regional meetings hosted in these languages in helping to normalize and celebrate language inclusion in academia ✦Institutions and organizations provide access to local institutional translation services to support individuals and increase their visibility, e.g., through protected funds for lanaguage translation for scholarly outputs from scholars affiliated with the institution or through provision of language translation services at the insitution ✦Academic writing services, workshops and trainings be made cheaply available to all researchers, or provided internally to scholars affiliated with the institution ✦Institutions provide processes to report instances of bias to advocate for individuals affected by language
Prior history of collaboration indicated by publication history and volume	Status quo bias; Inequity in power	✦Publication history and volume provide biased measures of research engagement or collaboration ✦Use in funding and editorial processes perpetuates bias, reinforces existing power dynamics, and obscures collaborative efforts demonstrated through other venues	**Global North–South, Local North, Global South–South, Local Global South:** Authors and institutions should distribute the power accrued to researchers with considerable publication history and volume by encouraging through: ✦Minimized engagement of Western researchers/institutions in LMIC contexts where equitable collaboration may not be possible such as through ensuring adequate research protected time for faculty, providing research capacity-building of local researchers and developing communities of practice that support **Global South or Global South–South collaboration:** ✦Increased divestment of power to LMIC researchers where power otherwise weighs heavily in favor of Western researchers ✦Encouraging, promoting and rewarding South–South collaboration without need for Western collaboration	**Global North–South, Local North, Global South–South, Local Global South:** ✦Funding bodies, publishing entities and HIC academic institutions ensure that measures of collaboration are more broadly representative and include such factors as: years of collaboration, shared service, letters of support from vulnerable populations, gray literature, and individual statements of collaboration documenting these and other efforts

This table presents common factors currently used to reflect equity, representation and inclusion in global health research, opportunities for bias that emerge as a result of this use, and practical challenges that these factors may pose for research. CFIR constructs are used as follows: the 'Inner Setting' refers to specific institutions and research entitities that house and pursue collaborations in global health research, and 'Outer Setting' refers to funding, editorial and peer-review policies and processes that exert considerable influence over the shape and outcomes of research outputs.

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and sub-domain constructs established as core to successful and sustainable implementation strategies. In other words, if each of the five domains are optimized, then the thing, or intervention, will have better short-term uptake and long-term achievement of its purpose. On the other hand, if there is failure to optimize a domain, there will likely be challenges during implementation of the intervention and in achieving the desired implementation outcomes. CFIR further delineates each of the five domains with factors, or determinants, that contribute to the collective success of that domain. The five domains are: "Intervention Characteristics" recognizing that "key attributes of interventions influence the success of implementation (Greenhalgh et al., 2004; Rabin et al., 2008); "Outer Setting" (which includes "external strategies to spread interventions including policy and regulations, external mandates, recommendations and guidelines"); "Inner Setting" (which includes implementation climate or "the absorptive capacity for change, shared receptivity of involved individuals to an intervention and the extent to which use of that intervention will be rewarded, supported, and expected…"); "Characteristics of Individuals" (exploring the fact that "organizations are made up of individuals and, ultimately, that the actions and behaviors of individuals. Affects implementation…"), and "Process" (which includes how engagement is conducted or how "attracting and involving appropriate individuals in the implementation and use of the intervention" occurs; this is recommended through a combined strategy of social marketing, education, role modeling, training, and other similar activities).

For our assessment, we interrogated the "Inner Setting" and "Outer Setting" domains of current systems and approaches to tackling decolonization in global health research, in order to propose alternative measures with lower risks of bias. For this paper, we define the Inner Setting as academic and research institutions leading and participating in global health research collaborations. Constructs that apply to this setting include the structure, culture, and communications within these institutions and their readiness to implement changes. The Outer Setting represents funding, editorial, and peer review policies, procedures and practices that exert influence on knowledge production in global health. We used the CFIR to develop a new guide (shown in Table 1) that others can use to actualize and assess decolonization in the academic context.

Domains of action in the process of decolonization

We adopt Sharma and Sam-Agudu's categorization of the domains in which decolonization in global health research may occur, and where our proposed measures of assessment might be deployed (see Figure 1), (1) the global North–South interface (research collaborations between institutions in high income, former colonizing countries,- and low-middle income formerly colonized countries- e.g. Portugal and Brazil); (2) the global South–South interface (research collaborations between two institutions in low-and-middle income or formerly colonized countries, e.g., Nigeria and Kenya); (3) the local global South setting (research conducted in-country by one or more institutions within a formerly colonized country, e.g., India); and (4) the local global North setting (research conducted in-country in a high-income or settler-colonized country, e.g., Canada; Sharma and Sam-Agudu, 2023).

Global North–South/global South–North

This point of action is where the bulk of decolonization efforts are planned for, or occur, because of the history and legacy of colonization of global South states by global North states, and the prevailing North–South inequity in global health research resources and knowledge production. Actors in this domain include individual researchers, and academic and health institutions in the global North, and their global South counterparts. Decolonization actions include "lean out" actions that require global North actors to redistribute resources and power, such as sharing or yielding leadership and enabling global South participation and leadership in authorship, as well as prioritizing the research needs of global South institutions and communities (Lawrence and Hirsch, 2020; Abouzeid et al., 2022). Global South actors also have responsibilities in decolonization at this interface, which include "leaning in" to establish or strengthen ownership, asserting leadership, self-education to recognize, denounce, and counteract coloniality, and making substantial and sustained local investments in global health research (Oti and Ncayiyana, 2021; Sharma and Sam-Agudu, 2023). To establish a lasting culture of decolonial action, both sets of actors should also train their students to identify and address colonialism in global health (Keynejad et al., 2023; Perkins et al., 2023), support critical evaluations of equity in research collaborations, and make functional provisions for reporting and resolving issues around equity in global health partnerships. The measures we propose in this article can serve as a resource for establishing a culture of decolonial action.

Global South–South

This point of action involves entities in low- and middle-income countries in the global South and focuses on interactions between settings that share similarities in geography, colonial history, climate/climate changes environment, social mores, and/or disease epidemiology. Examples of South–South research partnerships where decolonization actions and assessments may occur include collaborative projects on emergency and disaster medicine in conflict-involved areas in the Horn of Africa, tuberculosis in South Asian countries, or the effect of climate change on Indigenous people in South American countries. Decolonization actions here include expanding opportunities for more of such multicounty, cross-regional collaborations. Anti-colonial collaborations and discourse in this domain can motivate and support global South researchers and institutions to assert leadership through collective social and political action, and facilitate the establishment, strengthening and financing of high-quality local research and research institutions. Decolonization actions in this domain would leverage strength and power in numbers and geographical expanse to achieve paradigm shifts in the status quo.

Local global South

Actions at this point concern researchers and institutions within the same global South country. Beyond addressing North–South disparities in global health research, decolonization actions should consider prevailing local disparities (e.g., based on class, ethnicity, indigeneity, or gender) that may create and sustain inequity in global health research leadership and participation. This domain also

includes local custodians of Indigenous health knowledge and practice, such as traditional birth attendants and traditional bone healers. This is a particularly important domain for actions to "decolonize the mind," where local global South actors unlearn the untruths of colonial education and eliminate their internal coloniality (Oti and Ncayiyana, 2021; Sharma and Sam-Agudu, 2023). As recommended for the global South–South, we propose that decolonization actions in this domain involve "leaning in" and rallying social and political support and resources around local knowledge production.

Local global North

While we address decolonization of global health research in the global South, we acknowledge that the global North is not homogenous in resource access and distribution. While much of the global health funding and programmatic infrastructure is centered in the global North, researchers from, and institutions dedicated to Indigenous/minoritized groups have had limited access. For example, in the United States, Canada, Australia, researchers from Indigenous and minoritized groups such as Native American, Black, Latino and Aboriginal people have historically been marginalized or excluded from research leadership, participation and benefits (Hill and Holland, 2021; Laird et al., 2021; Roach and McMillan, 2022; Garba et al., 2023). We acknowledge existing literature on Indigenous decolonization in academia, and recognize the foundational health knowledge and shared experiences of marginalized populations in the global North (Held, 2019; Willows and Blanchet, 2022; Eisenkraft Klein and Shawanda, 2023; Garba et al., 2023; Wispelwey et al., 2023). We build on this work and propose measures for the global North to address local inequities in global health research, particularly those arising from oppression and discrimination from systems of slavery, racism, white supremacy, and settler colonialism.

Global North–North

The North–North interface involves interactions between resource-rich institutions and countries that have contributed to, and/or benefitted from inequities in global health research established or perpetuated by racism, white supremacy, colonization and coloniality in both the global North and the global South. For this domain, we recommend collaborative action by, and between global North institutions to support the measures for decolonization in the North and South domains. As global South entities "lean in," global North allies in decolonization should also commit to "leaning out" actions that address inequities in global health research. Furthermore, global North entities have an opportunity to collaboratively address inequities in Indigenous individual, institution and community representation, participation and knowledge production in global health research (Held, 2019). However, it is important to note that North–North action must also be informed by Indigenous and other minoritized groups within and across borders (Held, 2019). Proposed actions for decolonizing global health research restorative justice, such as substantial research education and funding opportunities reserved for Indigenous and other minority groups. In this domain, such opportunities should be presented as regional, rather than national initiatives, recognizing geographical commonalities and inequities experienced by the people groups affected by colonialism.

Measures, biases, proposals and actors

Author names and institutions

Author names in manuscripts and grants are routinely used in assessing diversity, inclusion, and equitable study setting (Milkman et al., 2012; Moss-Racusin et al., 2012; Kozlowski et al., 2022). Currently, evaluations based on names are left to the judgment of individual reviewers, without much guidance on how to use author names for these assessments. Names, however, are in themselves complex products of history, and while reflective of certain identities, may not be accurate nor readily associated with all of an individual's intersecting identities (Kozlowski et al., 2022). The authors have experienced some adverse results of this personally, having received reviewer comments such as "This should be reviewed by a native speaker," "The authors failed to include adequate representation from the target country," and "Grant team representation is not reflective of site partners" in cases where the authors were native speakers of English but with foreign names or affiliations, or where the study included authors and team members whose names or affiliations may have not made it immediately apparent that they were from the target countries. Leaving these determinations of identity, then, to the discretion of editors, reviewers, and other agents may not result in accurate conclusions and risks exposing assessments of inclusion and representation to naming and belief biases–the assumption that an author with a name associated with a particular place actually comes from that place.

Using author institutions as indicators is similarly problematic. First, different individuals within the same institution may experience different levels of power and access to resources, some of which may be informed by such factors as seniority, gender, academic rank, race/ethnicity, religion, and other characteristics that may intersect with these (Snow, 2008; Thoits, 2010; Shannon et al., 2019; Batson et al., 2021). As such, an institution's name or location may not accurately reflect an author's access to resources. Second, it has become increasingly common for academics to have affiliations at multiple institutions, sometimes in different geographical locations. In turn, it is not uncommon for researchers to list different institutional affiliations for different academic outputs. For example, authors might list affiliations with institutions in low-resource settings where studies were conducted, while maintaining affiliations with institutions in high-resource settings that may provide access to resources not available in the low-resource settings. In situations like this, the primary affiliation tells us precious little about the conditions that shape global health outputs, and, as with author names, editors and reviewers reviewing global health grants and papers have few resources to guide interpretation of author affiliations.

Proposed measures

As an alternative to the above-mentioned approaches, we propose less ambiguous means of considering author relationships to study settings to reduce name and belief biases. These include institutional Inner Setting actions such as mandating training on research bias and solutions such as naming bias, author bias and community-engaged research that could easily augment existing mandated research trainings for all engaged scholars – administrators, faculty, and trainees - (e.g., as a supplement to ethics training, CITI training etc.) already being done. The role for enforcement of completion could be overseen by the same offices

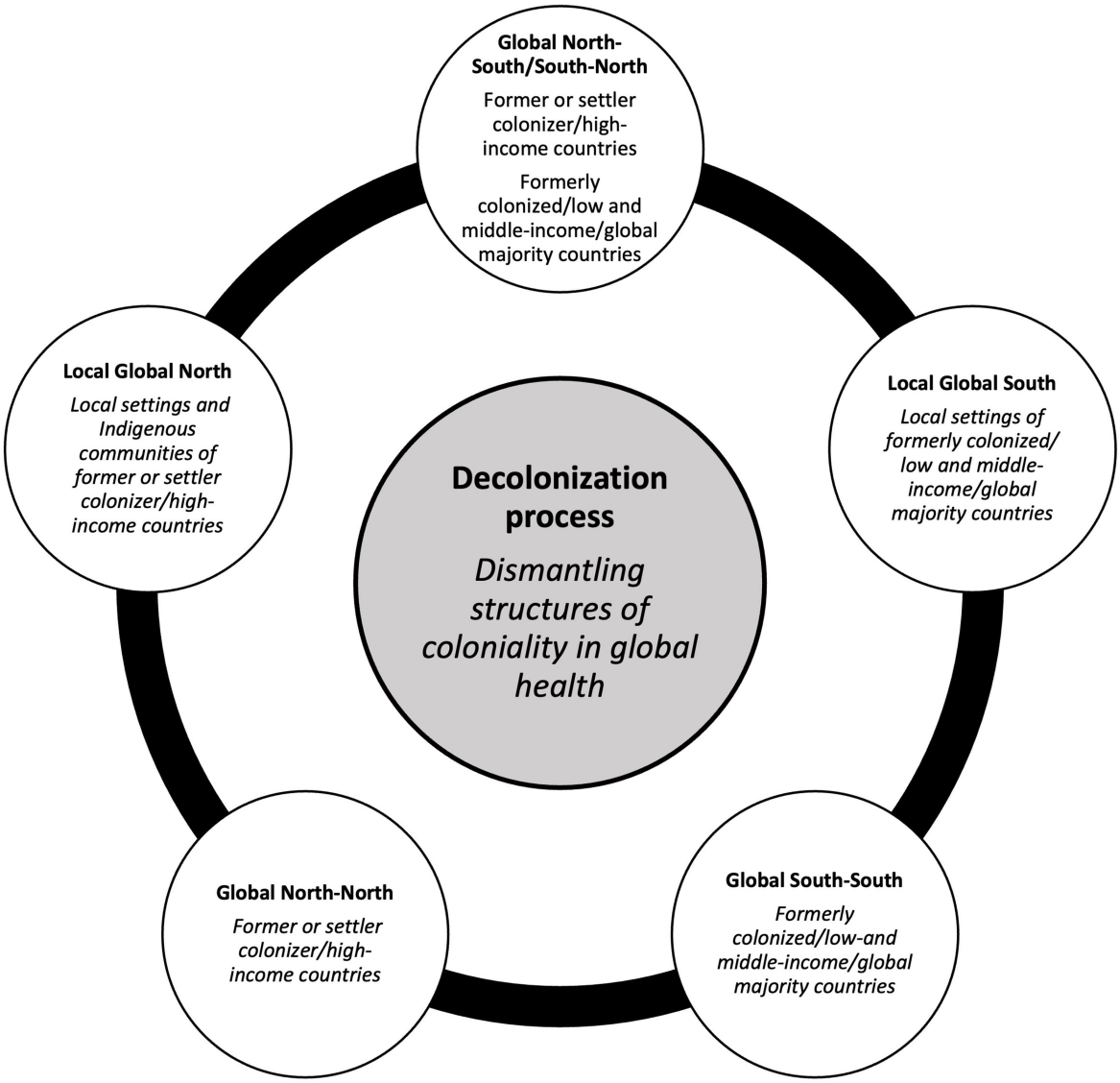

FIGURE 1
Domains of action for decolonization in global health research. The global domains for decolonization action are presented as a non-hierarchical circular continuum within which the different domains are interconnected. Adapted from Sharma and Sam-Agudu (2023).

ensuring other research trainings are completed prior to engaging in research.

Additionally, explicit acknowledgement of research relationships through reflexivity statements in grant or manuscript cover letters or elsewhere should be done (Saleh et al., 2022). A reflexivity statement could include, for example, how many authors are from the host country or region and whether this includes the first or last author, without giving specific names or affiliations. Standardized means for reporting and ordering author affiliations, e.g., joint or alternating first and/or senior authorships, and multiple Principal Investigator mechanisms for global North–South projects are other means (Sam-Agudu et al., 2016). Funding, editorial, and peer review Outer Setting policies should include requiring the Inner Setting actions as standards for grant or manuscript submissions. In addition, Global South–specific recommendations include asserting their vital roles in research and establishing policy to requiring trained officers to review grant and manuscript submissions in which they are participating for equity. These actions can provide more accurate and nuanced reflections on positionality, connection, and representation in research (Table 1).

In the further future, a global body such as the World Health Organization could facilitate the enforcement and application of such guidelines by governments, research institutions and scientists in member nations. It would also be informative to conduct studies to examine how many journals and funding agencies have implemented the policies and the degree to which they are enforced.

Power dynamics in research partnerships

Collaboration is a key feature of global health work, bringing together perspectives, skills, and resources from a variety of contexts to generate research outputs. However, such collaborations can be influenced by context-dependent inequities in power, where "systems of inequality, such as sexism, racism and ableism, interact with

each other to produce complex patterns of privilege and oppression" (Nixon, 2019). These inequities shape differences in resource access experienced by different collaborators; influence distributions of labor, recognition, and reward throughout the research process; and may inform how research is interpreted and valued.

The consequences of this inequity are demonstrated in the disproportionately large influence that global North partners have in global health research leadership, e.g., recognized PI and co-investigator roles rather than non-acknowledgement of key global South or Indigenous/minoritized contributors; decision-making in projects, institutional, national, regional and global agendas; publication representation; invitations and application to present at conferences and other meetings, selection for merit awards, and funding, among others (Boum Ii et al., 2018; Mbaye et al., 2019; Eichbaum et al., 2021). Albeit improving, even this limited representation has come with substantial compromise on the part of global South researchers, who may be cursorily added as "partners" and middle authors on research papers and presentations to satisfy requirements for global South "representation." Global South researchers may experience particularly high pressure to make these compromises in order to maintain relationships with the global North collaborators, who may be important sources of prestige, funding, opportunities for career advancement, and other benefits.

Proposed measures

To address issues of power in partnerships, we propose the use and disclosure of memoranda of understanding (MOU) between collaborating groups, to establish each partner's role and scope of work at the earliest possible opportunity and limit the extent to which these roles are influenced by inequities in power (Boum Ii et al., 2018; Abimbola et al., 2021). Gatekeepers such as journal editors and grant funders could play a role in enforcing an MOU, for example by comparing the author contributions listed in a submission to those in the MOU and asking the authors to explain any discrepancies. Having an institutional point person, such as a chair or dean of global relationship (or other ombudsperson), might also help, similar to the role of DEI specialists in the United States (Parker, 2020; Davenport et al., 2022). Additionally, funding, editorial and peer review bodies have a key stake in implementing and enforcing equitable partnerships in research outputs (see Table 1); this might be done through implementing clear statements on inclusion as part of journal mission and objectives, incorporating evaluation criteria for editors and reviewers to interrogate evidence of partnership in research submissions and through dedicated calls soliciting innovative Global South or indigenous led research team outputs, among other reward strategies to promote such work.

We also propose greater institutional support for research partnerships to address issues of power, for example, increasing protected time and academic benefits for faculty engaged in building research capacity for historically or currently disadvantaged personnel (Boum Ii et al., 2018).

Dominance of standard American/British English

Much of the infrastructure and activities surrounding global health research require or assume a command of Standard American or British English (Gnutzmann, 2008; Ammon, 2011; Curry and Lillis, 2024). As such, most reviewers and agencies with decision-making power are located in primarily English-speaking countries such as the United Kingdom and the United States of America. Ultimately, a significant proportion of scientific conferences, journals, and grants default to English language, conferring an advantage to English speakers and excluding large proportions of the global South and parts of the global North. Institutional prestige has also been found to correlate strongly with institutional use of English (Hultgren, 2016).

English language supremacy is rooted in colonial and Eurocentric theories of knowledge (Thiong'o, 1992; Finkel et al., 2022; Wanyenze et al., 2022). The adoption of British and American English as standard language in much of global health furthers this, reproducing Anglophone hierarchies of linguistic respectability in global health (Tupas, 2015). This also presents barriers to the dissemination of global health research, with translation into local language often required to communicate findings for patient populations and wider audiences in settings in which the research was conducted, thus prioritizing the "foreign gaze" over the "local gaze" (Abimbola, 2019).

Proposed measures

Alternatives to English language as a default might acknowledge the usefulness of English as a *lingua franca* while increasing the availability of English and non-English editing and translation services. The rise of artificial intelligence (AI) and large language models may help increase this access (see Table 1) by facilitating robust, reliable, and affordable AI editing and translation (Jiang and Lu, 2020). Editorial and funding processes can also become more sensitive to language diversity by supporting authors' and applicants' access to translation services. However, limited access to these resources due to logistical or financial limitations (such as affordability of interpreters for individual academics or even departments in low-resource settings, capacity of existing interpreters to translate scientific/technical writing, and lack of ability to reverse translate in order to assess accuracy of translation) may constrain the effectiveness of these approaches. In addition, AI may introduce its own biases to research texts.

Local, national, and international institutions in the global South may provide increased training on academic writing in non-English languages and target local journals that accept non-English manuscripts, while both global North and South institutions can provide translation services where possible. Concurrently, journals, conferences, and funding bodies can reduce language inequities by providing more opportunities for the publication and dissemination of work produced in primary languages beyond English.

Research expertise and history of collaboration via publication history and volume

Editorial and funding decisions consider research experience, which is often assessed by the history and volume of individual or collaborative publications (Stossel, 1987). While such metrics are relevant to evaluating researcher expertise and history of collaboration, they may also entrench privilege and perpetuate disparities in research, where highly recognized researchers and institutions disproportionately access opportunities for further reward, while the efforts of less-well-known counterparts receive substantially less

opportunity and reward (Lavery et al., 2013; Piper and Wellmon, 2017). The over-reliance on publication-focused metrics also obscures other meaningful types of engagement in global health research, such as through advocacy or capacity building. For example, collaborations built on grassroots community engagement and organizing may be overlooked because of a lack of, or a seemingly less substantial, publication history.

Proposed measures

We propose that academic institutions work to redistribute the power accrued by researchers with more expansive publication histories by facilitating equity-driven pairings, mentoring, and collaborations with peers who may lack this experience. We also propose that editorial and funding processes integrate assignments of value to factors beyond publication history, such as duration of collaboration, service on committees and in public-facing projects, and letters of recognition and support from traditional health practitioners, study populations and communities.

Discussion

Our proposed measures for standardizing assessments of decolonization in global health are informed by other foundational and transformative scholarly works, referenced previously, that have brought much needed attention to inequity in global health practice and knowledge production (Farnbach et al., 2017; Boum Ii et al., 2018; Babyar, 2019; Hudson et al., 2020; The Lancet Global Health, 2021; Patterson et al., 2022). These measures, however, are still limited by conventional constructs of "donor/expert/advisor/capacity builder/PI" versus "recipient/learner/beneficiary/data collector/study participant" in global health, which may often value the contributions of researchers and institutions in the global North over those of their counterparts in the global South, and so undermine global health equity (Abimbola, 2019; Abimbola et al., 2021; Khan et al., 2022). We sought to be mindful about this construction in identifying specific ways researchers in a variety of contexts may use their privileges to advance equity in global health, and in describing ways that researchers in resource-limited and resource-variable contexts might "lean in," using the resources at their disposal to highlight and expand their roles in global health.

This "leaning in" resonates with the transformative article by Boum Ii et al. (2018), and its call to place African researchers closer to the center of their research partnerships through measures such as improving communication, advancing mentorship and capacity-building, driving funding strategies, and redefining "academic currency" (Boum Ii et al., 2018). This has also been discussed by several articles by global South authors at home and in the diaspora biases (Boum Ii et al., 2018; Iyer, 2018; The Lancet Global Health, 2018; Abimbola and Pai, 2020; Erondu et al., 2020; Pai, 2020; Araújo et al., 2021; Daffé et al., 2021; The Lancet Global Health, 2021; Pant et al., 2022). We build on these prior works to propose solutions to address inequity in global health knowledge production. These proposed actions focus on dismantling structures of coloniality at multiple levels by addressing biases inherent to current editorial and funding policies and practices in global health research.

We also encourage interrogation of inequitable approaches to inclusion and productivity in research, such as cursory authorship positions that shortchange global South contributors. A less discussed but impactful factor in research productivity is language, and our proposed measures include ways to expand the languages used to perform and discuss global health beyond English. It is intuitive that "global" health research should face the fewest possible barriers to global accessibility. Advances in technology, such as the emergence of generative AI (Abimbola et al., 2021), may provide new opportunities to eliminate the barriers to access that language may create.

Our framework is intended to be an initial, broad description of an approach that could apply to multiple domains, rather than a granular prescription for implementation. Although the broad strokes could be standardized globally, such as shared creation of research projects and early determination of roles in those projects so that each participant receives appropriate credit, the details of implementation are likely to vary from location to location, given differences in culture, history, and specific challenges. It will be interesting to see how individuals, institutions, and regions adapt and apply the broader framework in their nuanced contexts.

Limitations

While we leveraged a theoretical framework (CFIR) to frame decolonization actions, we did not apply decolonial theory to the proposed actions. We agree with Chaudhuri and colleagues, whose position is that decolonization in global health must be grounded in decolonial theory, and that conceptual frameworks developed around understating of oppression and power, rather one-off metrics-based checklists and roadmaps, are needed to move from theory to practice (Chaudhuri et al., 2021), and laud further work that undergirds implementation approaches in decolonial theory. All the same, we present a process guide for changing culture in global health research, which is inherently based on colonialism and power imbalances. As a practical tool for immediate action, we also appreciate that each of the recommended strategies may not be implemented at once: this may depend on factors such as implementation climate, individual engagement, and cost. However, we believe that this can act as a resource for organizations, institutions, individuals, or groups of individuals seeking to guide discussions on consensus and prioritization of strategies to improve decolonization efforts and, through concerted discussion, generate a practical timeline for implementation. In future iterations, the proposed measures could also be identified and defined by individuals, institutions, and regions to encompass other CFIR domains to address nuances in their specific context.

We take the opportunity to state here that we are African global health researchers in the diaspora, who, while maintaining ties to our countries of origin, have affiliations to highly resourced global North institutions. Though we are directly impacted by legacies of colonialism in our lives and global health work, our experiences still may not reflect those of others without these affiliations and their associated privileges (Serunkuma, 2022). Global South colleagues without affiliations to global North institutions likely contend with more formidable manifestations of coloniality in global health research that are not reflected in this article. Pai (2022) forbes article considers the role of diaspora researchers in global health work and describes them as "double agents" in global health who leverage their global North privileges to identify and address inequities in their countries of origin. This was the perspective we sought to bring to this article.

Conclusion

Current measures for assessing the decolonization process in global health carry risk of bias, creating a need for standardized approaches. We acknowledge that research contexts and collaborations across different global North and South domains may require substantially varied strategies; thus, our proposed measures will not be universally applicable. Nevertheless, we stress that the work of decolonization, like research, is an iterative process. We anticipate that these and other such decolonization measures can be further developed into validated, theory-based approaches that will replace or improve on the status quo. Eventually, the effect size as well as costs of implementing these strategies can be measured in order to guide resource allocation. We join other practitioners in continuing to expand the body of knowledge and practice for decolonization and to promote the full practice of equity and justice in global health research.

Data availability statement

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

Author contributions

CN and MM contributed to original conception and design of the study, manuscript. CN wrote the first draft of the manuscript. NAS-A contributed Figure 1 and provided critical review for intellectual content. All authors wrote additional sections of the manuscript and contributed to analysis, manuscript revision, read, and approved the submitted version.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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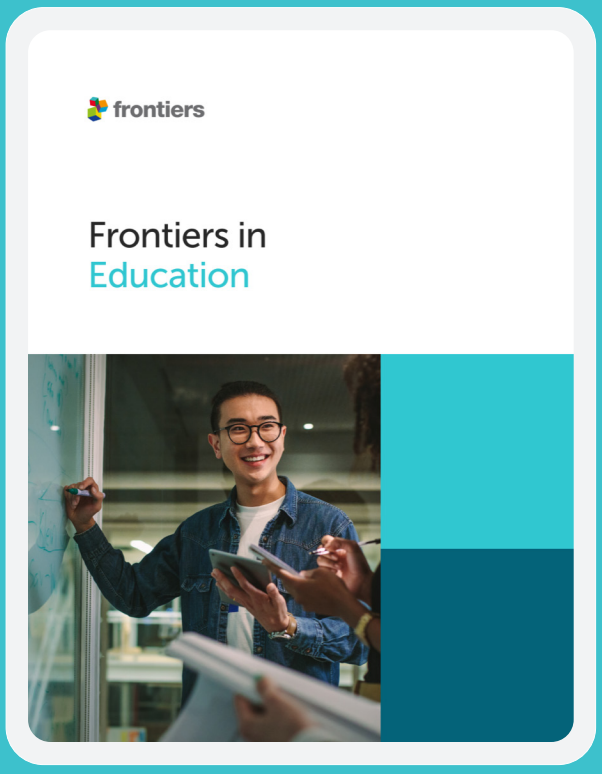

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