



Undergraduate Surgical Education: a Global Perspective

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Abstract

Undergraduate surgical education is failing to prepare medical students to care for patients with surgical conditions, and has been significantly compromised by the COVID-19 pandemic. We performed a literature review and undertook semi-structured reflections on the current state of undergraduate surgical education across five countries: Egypt, Morocco, Somaliland, Kenya, and the UK. The main barriers to surgical education at medical school identified were (1) the lack of standardised surgical curricula with mandatory learning objectives and (2) the inadequacy of human resources for surgical education. COVID-19 has exacerbated these challenges by depleting the pool of surgical educators and reducing access to learning opportunities in clinical environments. To address the global need for a larger surgical workforce, specific attention must be paid to improving undergraduate surgical education. Solutions proposed include the development of a standard surgical curriculum with learning outcomes appropriate for local needs, the incentivisation of surgical educators, the incorporation of targeted online and simulation teaching, and the use of technology.

Keywords Medical school · Undergraduate · Education · Training · Skills

Introduction

Clinical practice is seeing and hearing and doing and if we have decided that surgery is part of the curriculum then it can only be taught in relation to patients who are seen, examined and followed by the students.—
Professor Douglas Roy (1925–2003) [1]

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The challenges and opportunities for undergraduate surgical education are captured by this quote from Professor Douglas Roy, who led three surgical departments across three continents during his career. It is important to marry theoretical and practical teaching, and to expose students to the entirety of the surgical care pathway, from the initial diagnosis; to the shared decision-making between the patient and the surgeon; and to pre-operative optimisation, surgical therapy, and postoperative care. This holistic overview is not only essential for aspiring surgeons, but also for future physicians and general practitioners who may be managing patients' long-term condition(s) and facilitating their post-operative recovery [2].

However, these learning needs are often unaddressed due to the gap between the theory that medical students are taught, and the limited opportunities they have to apply their theoretical learning. Furthermore, the lack of structure and support during surgical rotations [3] leads to decreased exposure to the surgical care pathway as a whole. This results in unfamiliarity with the overarching clinical principles of caring for patients with surgical conditions. Unsurprisingly, medical students report feeling less prepared for surgical placements and emergency surgery on-calls as trainee doctors, compared to medical placements and on-calls [4].

The authors of this paper are a group of medical students and junior doctors working and learning in different health systems in Egypt, Morocco, Somaliland, Kenya, and the United Kingdom (UK). We conducted an initial literature review using the PubMed database to identify available literature on the current state of surgical education in our respective countries. We discussed this literature and our lived experiences of surgical education to develop prompts for individual semi-structured reflections. The themes which emerged in our discussions and reflections form the basis of this article. In this article, we examine the main barriers to meaningful surgical education at the undergraduate level, consider the impact of the COVID-19 pandemic, and propose potential solutions to address these barriers.

Challenges

Lack of Standardised Undergraduate Surgical Curricula and Learning Objectives

Table 1 outlines the similarities and differences in surgical curricula, and teaching and assessment methods for surgical education across medical schools in Egypt, Morocco, Somaliland, Kenya, and the UK. Of these five countries, national guidelines for surgical education do not exist in three countries. For example, in the UK, the General Medical Council's latest standards for medical education and training, published in 2015, do not mention surgical training [5]. Some countries, such as Kenya, have central bodies which broadly outline the scope of undergraduate surgical education: the curriculum outlined by the Kenyan Medical Practitioners and Dentists Board specifically mentions key topics and skills within several surgical specialties including general surgery, orthopaedics, ophthalmology, and otolaryngology [6]. However, these curriculum requirements are not communicated directly to medical students; instead, students rely on individual departments within their specific medical schools to cover these topics. Furthermore, different medical schools in Kenya are affiliated with hospitals with differing levels of resources and infrastructure. Therefore, universities tied to small district hospitals may find it difficult to adequately expose their students to advanced surgical care, as well as to certain subspecialties. This may result in discrepancies in surgical education despite the availability of a standard surgical curriculum.

This lack of standardisation engenders several issues, which are discussed further below.

Discrepancy Between Theoretical and Practical Learning

Without standardised surgical curricula, medical schools are not held accountable for the surgical education they provide.

This leads to a lack of alignment between theoretical and practical learning objectives. A study of Moroccan medical students' experiences of learning about maxillofacial emergencies demonstrated that the correlation between theoretical learning in lectures and practical learning in the emergency room was only 27.5% [7]. Furthermore, due to the conventional structure of medical school teaching, anatomy is often taught at the beginning, with students being unable to observe anatomical principles being used in practice until their surgical rotations much later in their medical education (Table 1). Although medical students have consistently rated anatomy teaching as having high medical relevance [8], medical students in their clinical years report being less confident in their anatomical knowledge [9].

The reflections undertaken by the authors demonstrated a consistent disparity between the content and complexity of theoretical teaching and the limited opportunities to observe and apply these principles in practice. Practical learning opportunities are required to reinforce theoretical concepts, and to improve students' confidence with applying these concepts to patient care.

The undergraduate surgical curriculum covers surgery extensively in a way that could be overwhelming. Thus, there is a need to prioritize and focus on the topics most relevant to clinical practice and local needs, with general practitioners in mind.—NB, Egypt

Overreliance on Student and Educator Motivation

Secondly, in the absence of a mandatory surgical curriculum with learning objectives, medical students may believe that surgical education is less important. This belief may be perpetuated by a lack of assessment of surgical skills: Table 1 shows that in all the countries considered, standardised assessments of practical skills other than history-taking and clinical examination are absent or rare. Therefore, students may be tempted to focus on other topics that they consider more immediately relevant to their undergraduate education:

Even if the perfect opportunity arises for students who are not surgically-inclined to observe or participate in theatre, there is a sense of optionality about learning about surgery. I have seen students behave with the attitude, "This isn't for me, it's all so specialised, I don't have to be here - I would rather catch up on my respiratory notes instead"...For those who obtain exposure, are the experiences standardised? Is the learning useful, or are students simply observing procedures that they do not need to memorise at their undergraduate level? Perhaps this is what deters non-surgically-inclined students – there is little drive to be in theatre, there is little drive to stay.—UAA, UK

Table 1 An outline of the similarities and differences in the curriculum, teaching, and assessment methods for surgical education across medical schools in Egypt, Morocco, Somaliland, Kenya, and the UK (*OSCE Objective Structured Clinical Examination*)

	Egypt	Morocco	Kenya	Somaliland	UK
Medical school	Faculty of Medicine—Zagazig University	University Cadi Ayyad, Faculty of Medicine and Pharmacy, Marrakesh	University of Nairobi	Amoud University, College of Health Science, School of Medicine and G Surgery	University of Leeds
National guidelines for undergraduate surgical curricula	The Supreme Council of Egyptian Universities has a dedicated department for medical education which mandates learning objectives nationally for each subject, including surgery.	The medical school curriculum in Morocco is set by the National Commission for the Coordination of Higher Education (CNCEs), but there is no specific mention of surgery.	Medical Practitioners and Dentists Board outlines a core medical school curriculum, mentioning key topics and skills within several surgical specialties [6].	The Ministry of Health, the Ministry of Education are currently working on harmonising the medical education curriculum for the first time, and surgery is included specifically.	The General Medical Council's 2015 standards for medical education [5] do not mention surgical training.
Theoretical teaching methods	<ul style="list-style-type: none"> • Small group teaching (30–40 students per group) • Virtual learning with recorded lessons • Didactic lectures, currently supplemented with online learning due to the COVID-19 pandemic • Weekly online interactive sessions 	<ul style="list-style-type: none"> • Didactic lectures—there has been a transition from in-person to online during the COVID-19 pandemic 	<ul style="list-style-type: none"> • Didactic lectures—there has been a transition from in-person to online during the COVID-19 pandemic • Small group teaching for students rotating in surgery (15–20 students per group) • Weekly surgical grand rounds (mainly targeted towards surgical residents) 	<ul style="list-style-type: none"> • Teaching on ward rounds by surgical interns and residents; students have been unable to visit wards due to the COVID-19 pandemic • Virtual rounds with King's College London via the Medicine Africa Platform 	<ul style="list-style-type: none"> • Didactic lectures and interactive group teaching sessions—there has been a transition from in-person to online sessions during the COVID-19 pandemic • One day of surgical skills teaching in small groups in year 3 covering some theoretical knowledge
Practical teaching methods	<ul style="list-style-type: none"> • Skills lab at the end of year 6, where students learn surgical skills and practice on models • Year-long surgical rotation in year 6: daily rounds where lecturers present patients and go through their physical examinations 	<ul style="list-style-type: none"> • Workshops in years 3–6: suturing, basic surgical skills (variable frequency) • Online simulation and case study-based teaching in years 3–6 • 6 to 8 week surgical rotations (1 to 3 rotations per year) from years 3 to 6: ward rounds, bedside patient examination and discussion, case studies 	<ul style="list-style-type: none"> • Surgical rotations (8 weeks in year 6, 4 to 6 weeks in years 3 and 4): daily ward rounds where students are expected to present patients they have clerked and examined • Bedside teaching during clinical rotations in years 3–6 organised for different organ systems and diseases 	<ul style="list-style-type: none"> • 3-month surgical rotations in years 4 to 6 • Some students assist surgeries in year 2 (not mandatory) • Bedside procedures taught at patients' bedsides when possible 	<ul style="list-style-type: none"> • Surgical rotations (for some students in years 1 and 2, for all students in years 3, 4, and 5): ward rounds, observing in theatre, clerking patients, bedside teaching • One day of small group surgical skills teaching in year 3, covering skills such as suturing and scrubbing in

Table 1 (continued)

	Egypt	Morocco	Kenya	Somaliand	UK
Provision of formal learning objectives for surgery	Learning objectives are mentioned in the logbook and enforced by staff members. Each group is assigned a staff member who is responsible for their education.	Provision of learning objectives differs from one specialty to another depending on the head of the department. When a list of objectives is set and given to the students, residents may be advised to work on them with students, but are not obliged.	A list of topics is provided, but there is no enforcement or specific support to ensure all topics are covered. It is up to students to seek teaching, and faculty members are usually helpful and willing. There is a logbook with required practical learning objectives which are not enforced.	A list of common diseases in the community and common topics necessary for students to cover during their surgical rotations is provided. The university's clinical coordination office checks if all the topics have been covered by students.	Surgical Directly Observed Procedural Skills (DOPS, e.g. basic suturing, catheter insertion, and airway management) must be completed at least once if mandatory for that year. Objectives for surgical rotations are not clearly specified; they are set personally by the medical student, and/or the surgical lead for the placement.
Assessment of theoretical surgical knowledge	Assessment in year 6 at the end of the interactive online sessions, and during mid-term and final exams. The final exam covers clinical topics, operative techniques, anatomy, and radiological and pathological features.	Multiple choice question assessments at the end of the semester in which the surgical module was taught.	Written assessments, multiple choice questions, and essays at the end of surgical rotations. End of year written assessments and exams cover some surgical topics.	Students are assessed when presenting cases and their discussion of patient presentations during surgical ward rounds within surgical rotations. At the end of the degree, students take exams with multiple choice and long answer questions covering some surgical topics.	Anatomy is formally assessed in years 1 and 2 in spot tests or in the end of year exam. In the end of year exams, surgical knowledge is assessed via clinical scenarios or multiple choice questions about surgical conditions. Application of theoretical knowledge is assessed in OSCE examinations.
Assessment of practical surgical skills	Clinical skills (e.g. history-taking, clinical examination, knowledge of surgical tools) are assessed during the final exam for year 6.	End-of-rotation exams using clinical case studies assess students' history-taking, examination, clinical reasoning, and understanding of the investigation and management of surgical conditions. Exams are organised differently depending on the head of department.	There is little verification of procedures recorded in logbooks. Final year exams have OSCEs to assess history-taking and clinical examination skill; one practical skills station covers skills such as suturing and knot tying.	Exams at the end of every surgical rotation in years 4–6 assess history-taking; clinical examinations; and occasionally, basic surgical skills such as suturing.	History-taking, examination, and some clinical skills are assessed in OSCEs. Feedback is provided by a clinician upon completion of basic procedures such as basic suturing and catheterisation in years 4 and 5; these skills may also be assessed in OSCEs.
External surgical teaching	Student societies may offer short courses on surgical topics.	None—there is no surgical society run by and/or for medical students in Morocco.	Student societies organise structured courses on basic surgical skills.	Student societies, in partnership with international societies (e.g. InciSiON, International Association of Student Surgical Societies), organise conferences and short courses. These courses cover topics such as suturing, sterilisation, and the WHO surgical safety checklist.	Student societies host surgery-related conferences and surgical skills courses with defined learning objectives.

Even if students themselves are motivated, the quality of their surgical learning remains dependent on the attitude and motivation of educators without compulsory surgical learning outcomes. These issues are apparent when it comes to operating theatre-based learning. In addition to influencing students' career choices [10], medical students recognise that learning in theatres promotes knowledge retention and integration, enhances their ability to explain surgical procedures to patients, and is beneficial for their future roles as trainee doctors [11]. However, 43% of students in a survey at the University of Leeds reported negative experiences in the operating room [12]: students felt unwelcome, believed that staff had unrealistic expectations of their knowledge, and reported poor or inadequate learning experiences. A survey of UK medical students by Ravindra et al. [13] found that 80% of students believed attending theatres should be a mandatory course requirement, but self-reported attendance was low; students interested in surgery were significantly more likely to have attended more operating theatre opportunities than students who were undecided or not surgically inclined. A study of Australian medical students by Lyon showed that students found attending theatres to be more useful if they had specific learning objectives [11]. Overall, these studies support the need for structured surgical learning within clinical environments, particularly in operating theatres.

Lack of Human Resources for Undergraduate Surgical Education

Human resources are crucial for meaningful surgical education. Medical students consistently report that first-hand learning experiences with surgeons strongly influence their education. In the study by Lyon [11], there was a strong positive correlation between students' perceived usefulness of theatre learning and the willingness of senior surgeons and surgical registrars to teach them. Furthermore, surgical consultants and registrars have been shown to be important sources of positive and negative experiences during students' undergraduate years [10].

Unfortunately, the increasing clinical and academic commitments for surgeons leave little time for teaching [14]. This is especially true for surgeons working in low- and middle-income countries (LMICs)—in one survey of members of the Central, South, and East African College of Surgeons, the incidence of burnout was nearly 40% [15]. These commitments lead to less protected teaching time, with adverse consequences for surgical education. A Society of Academic and Research Surgery report [16] argues that surgical staff not attending timetabled teaching slots for medical students can lead to students misinterpreting this as an indication of disinterest or contempt.

In theatres, medical students are often “at the end of the training queue”, with seniors prioritising more

experienced postgraduate trainees instead [11]. Medical students who prove themselves to be worthy—through their knowledge, professional behaviour, willingness to help, and perseverance [11, 17]—are offered a place at the front of the “queue” as a “reward”. However, even if they are allowed to scrub in, learning is hindered by limited engagement from surgeons focused on their case, a restricted view, and being relegated to “service provision” roles such as holding a retractor [3, 17]. Moreover, the practice of singling medical students out for such opportunities if they are deemed worthy risks contributing to exclusionary practices, whereby students from marginalised groups are granted fewer opportunities due to implicit bias [18].

Although medical students and new graduates may gain more theatre exposure in settings where they are considered an essential part of the workforce, adequate supervision is required to promote learning. A study of the preparedness of medical graduates for surgical internship in Kenyan district hospitals demonstrated a difference in expectations between the new graduates and their supervisors [19]: supervisors expected graduates to perform procedures independently after orientation, whereas graduates did not feel there was adequate supervision available when performing surgery. The study's authors suggest that this may be due to the heavy caseload in district hospitals compared to tertiary centres. In contrast, when Kenyan medical students doing their district hospital rotation were paired with consultants with a specific interest in medical education, they reported receiving more teaching on procedural skills compared to their rotation in a tertiary centre [20]. Therefore, the educational benefit of including medical students and new graduates as essential members of the surgical workforce appears to depend on the human resources available for supervision.

Outside of theatres, human resources continue to be essential in the provision of surgical teaching during ward rounds, which feature prominently in undergraduate surgical training across the world (Table 1). However, the learning derived from participating in ward rounds depends on the amount of time and energy that surgeons have to engage with medical students [21]. With expanding medical student cohorts and increasing numbers of students accompanying ward rounds [22], the effectiveness of ward round-based teaching is likely to be further reduced.

There is difficulty learning from shadowing and ward rounds due to limited time available for teaching, especially with increasing class sizes at medical school. Busy consultants result in students feeling “lost”. A lack of guidance regarding how to approach clinicals results in confusion, and subsequent loss of interest.—SS, Kenya

Impact of COVID-19

The COVID-19 pandemic has had a profound impact on undergraduate surgical education, exacerbating all the above challenges. Clinician redeployment to address the pandemic-related disease burden has been detrimental, particularly in areas where teaching methods are teacher-centred. For instance, in Morocco, lectures represent 90% of the academic teaching hours [23]. Medical schools have had to rapidly shift their teaching to online platforms, which has understandably affected the quality of teaching.

Medical students have had significantly reduced or no access to learning opportunities such as ward rounds and observing surgical procedures in theatre [24] (Table 1). This has widened the disparity between theoretical and practical learning. Even if medical students do have access to clinical learning environments, the marked decrease in operative caseload globally [25] further limits opportunities for surgical education at all levels of training. With postgraduate surgical trainees having difficulty completing the required number of procedures for their training [26], medical students are unlikely to be prioritised for surgical education in wards and theatres.

Finally, the impact of COVID-19-related burnout on surgical educators' availability and motivation to teach medical students should not be underestimated [27]. Even with the best intentions, the lack of time and the increased prevalence of exhaustion and depression amongst clinicians due to the unprecedented burden on healthcare systems will likely have adverse consequences for undergraduate surgical education.

Solutions and Opportunities

The marked variability in medical students' experiences of surgical education highlights the need for standardised national undergraduate surgical curricula with alignment of theoretical and practical learning objectives. These curricula need to be discussed with surgeons to ensure the training of a surgical workforce with skills appropriate for local needs. For instance, the Lancet Commission on Surgery has highlighted the lack of rural surgery rotations at medical school, and the effect this has on the density of surgical care providers in rural areas of LMICs [28]. The undergraduate surgical curriculum in Somaliland is an example of a curriculum which attempts to respond to local needs. Due to the paucity of healthcare workers in Somaliland [29], international partnerships have been established to address gaps in medical education. These partnerships deliver teaching to medical students on core topics, including surgery, with an emphasis on preparing graduates for practice [30]. Thus, a critical need to expand

the healthcare workforce in Somaliland appears to have sharpened the focus on delivering undergraduate surgical teaching that is fit for purpose.

When changes to the surgical curriculum are implemented, their effects must be audited to ensure that any changes made are helpful, and to ensure that educational institutions are held accountable for the delivery of learning objectives [31]. If institutions demonstrate their commitment to delivering standardised surgical education, students are more likely to conceptualise surgery as an important part of their undergraduate medical education and engage with available learning opportunities.

The unique challenge of surgical education is the need to allow inexperienced medical students access to clinical learning environments, in which highly specialised skills are being practised, without compromising patient care. It is even more challenging to achieve this across an entire cohort of students. Therefore, medical schools should deliver standardised teaching to upskill medical students in certain key areas so that they can safely and effectively be exposed to surgical care in clinical environments. Previous studies have developed detailed recommendations for preparing medical students for theatre-based learning [11, 32]. These include a comprehensive orientation, briefing on theatre "etiquette", defined objectives for theatre-based learning with a focus on key procedures, and negotiation of a specific role for students in theatre. Medical students, even those without any surgical aspirations, should be acknowledged as legitimate learners in clinical settings, as facilitating understanding of the surgical care pathway is essential to optimising patient care.

Furthermore, medical schools' commitment to surgical education should be reflected in their investment in both the physical and human resources required for undergraduate surgical training. If new medical graduates are required to perform procedures such as skin suturing and wound debridement independently [19], basic surgical skills training needs to be delivered as part of the undergraduate curriculum. Even in settings where newly qualified doctors would not be expected to independently perform procedures, provision of surgical skills training would flatten the steep learning curve for postgraduate surgical trainees, and ensure that the playing field is more level. Hakim et al. found that 97% of UK medical students who responded to their survey felt practical surgical skills should be incorporated into the undergraduate curriculum [33]. Evidently, there is an appetite for surgical skills training amongst undergraduates.

Simulation training is highly valued by medical students when learning practical skills, and medical schools should endeavour to teach basic surgical skills using simulation wherever possible [34]. A Moroccan study found that 90% of medical student participants were confident about their ability to transfer the suturing skills they learned via simulation

to their clinical practice [35]. The cost-effectiveness of simulation training is important to ensure equal availability of learning opportunities across medical schools. However, the cost of simulation teaching need not be prohibitive, with several low-fidelity bench models available for basic surgical skills training [36]. The intensive human resource requirement for simulation training also needs to be considered when increasing access to simulation training. For example, even though most medical schools in Morocco have been recently equipped with Medical Simulation Labs, their use is limited by the lack of trained teachers [23]. This issue may be addressed by sponsoring student surgical societies [32] and enabling near-peer teaching, with “training the trainer” courses to promote sustainability. In the UK, Kenya, Egypt, and Somaliland, student societies organise basic surgical skills and conferences, liaising with surgeons in their local institutions and international organisations to address gaps in undergraduate surgical education (Table 1).

There has been an explosion in the availability of remote learning resources since the advent of the COVID-19 pandemic, but these resources cannot be treated as a panacea. Generic online lectures on topics without explicit links to the medical school’s surgical learning objectives may result in students perceiving their teaching as being irrelevant to their studies and disengaging. However, online learning offers specific opportunities to make surgical education more engaging and clinically relevant. A collaboration between Zagazig University’s Surgery Department and EMLE Notes has eased the transition to online learning and allowed the surgical curriculum to be delivered through concise and engaging video lectures with graphics and audiovisual tools as opposed to text [37]. Furthermore, video recordings of surgical procedures with surgeons offering a step-by-step overview of the procedures may enable students to appreciate the intra-operative relevance of anatomy [3]. In the UK, online preparatory materials and targeted video lectures improved students’ engagement with surgical bedside teaching [38], thereby increasing the yield from bedside teaching for both students and busy surgical educators.

There is a danger of losing out on the valuable interaction between students and surgical mentors with remote learning. However, successful efforts have been undertaken to preserve the interactive aspect of remote surgical education. In Morocco, an interactive compact disc (CD) has been developed to take students through common pathologies in general paediatric surgery, allowing them to navigate clinical cases by answering a series of questions [39]. This “problem-based learning” approach represents an effective way to align theoretical and practical learning, especially when it comes to low-frequency, high-stakes surgical emergencies that medical students may not come across during their undergraduate training.

Virtual reality (VR) and augmented reality (AR) also hold great promise for remote surgical education, particularly with COVID-19 social distancing requirements [40]. Although there are technical challenges which may limit the use of VR and AR in low-resource settings, the VR industry appears to be addressing these obstacles and reducing the cost of devices [41]. Scalpel 2.0, a virtual teaching programme led by Stanford Medicine, has already piloted the use of VR headsets for anatomy teaching in Kenya [42]. However, to ensure continued benefit for LMIC medical students, particular attention should be paid to the sustainability of collaborations which deliver VR and AR teaching in LMICs.

Lastly, the teaching role of surgeons and postgraduate surgical trainees requires increased prioritisation and incentivisation. Surgical teaching time should be protected, and specific teaching roles delegated and appropriately incentivised. A study in Scotland demonstrated a marked improvement in student learning during the post-take surgical ward round with support from Clinical Teaching Fellows [21]. Surgeons’ involvement in medical education should be actively supported with targeted training in medical education, to ensure that surgical teaching is appropriate and relevant. As an example, in Somaliland, the “Prepared for Practice” partnership has trained over 100 academics in health education skills such as student-centred teaching, assessment, and curriculum development as part of the efforts to strengthen medical education [43]. Surgical trainers’ contributions to medical education should be valued on par with their research contributions, and specific career progression pathways should be designed for surgeons who are interested in medical education.

Conclusion

Despite most medical graduates worldwide gaining the dual qualifications of Bachelor of Medicine and Bachelor of Surgery, the equal weighting given to the latter does not appear to reflect the current state of undergraduate surgical education. The COVID-19 pandemic has caused further disruption to surgical training in medical schools. In view of the need to train a surgical workforce to address the global burden of surgical disease, it is time for a renewed focus on surgical training in medical schools. Medical schools need to invest in the physical and human resources required to deliver a standardised surgical curriculum that responds to local needs. After all, this represents an investment in the surgeons of the future, and in the physicians and general practitioners who will be delivering patient care along the surgical care pathway.

Author Contribution KR recruited the collaborating authors, coordinated the literature review, designed the semi-structured reflections, led the discussions, and wrote the manuscript. UAA and MK contributed to the literature review. UAA, MK, NB, SS, and HAD took part in the discussions and wrote semi-structured reflections. All authors read and approved the final version of the manuscript.

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Declarations

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