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CLINICAL ARTICLE

Obstetrics

Capacity building in operational research on obstetric fistula: Experience in the Democratic Republic of Congo, 2017–2021

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Abstract

Objective: To implement a Flexible Operational Research Training (FORT) course within the Fistula Care Plus Project, Democratic Republic of Congo, from 2017 to 2021.

Methods: A descriptive study using design and implementation (process and outcome) data. Two to four members of medical teams from three supported sites were selected for the training based on their research interests and level of involvement in the program.

Results: Two courses (13–14 months each) involving nine facilitators and 17 participants overall were conducted between 2017 and 2021. Most participants in both courses were medical doctors (67% and 71%, respectively) from the supported hospitals (83% and 77%, respectively). About half were women. In addition to classic face-to-face didactic modules, the courses integrated online platforms to cope with the changing contexts (Ebola virus and COVID-19). Most participants reported having gained new skills in developing research protocols, collecting, managing, and analyzing data, and developing research manuscripts. The two courses resulted in six scientific manuscripts and three presentations at international conferences. Participants subsequently published five papers from their research after the first course. The total direct costs for both courses were representing a cost of $3669 per participant trained.

Conclusion: The FORT model proved feasible, efficient, and successful. However, scaling up will require more adaptation efforts from programs and participating sites.

KEYWORDS
Africa, capacity building, Democratic Republic of Congo, FORT, operational research

1 | INTRODUCTION

Operational research seeks to improve the evidence base on interventions, strategies, or tools that can improve the quality, effectiveness, or coverage of programs in which the research is implemented.[1] Several operational research models exist, including the Structured Operational Research and Training Initiative (SORT IT), an outcome-oriented initiative that consists of three 1-week workshops over 9–12 months, with clearly defined milestones and expected output.[2–4] SORT-IT has resulted in numerous scientific publications

with first authors from low- and middle-income countries,[5] more qualified human resources for health who significantly contributed to influencing health policy and programs in settings where the research studies were conducted.[6] The model has been revised and adapted,[7,8] including at the country level where several local SORT-IT initiatives have been implemented (e.g. in Rwanda, known as Intermediate Operational Research Training; IORT),[9] Kenya,[10] and Pakistan.[11] Depending on local needs, available resources, and absorptive capacity, programs and countries choose the format that suits their context.[1,12,13] Apart from *Médecins Sans Frontières*, whose pioneering role in the popularization of operational research is recognized worldwide[14,15] and the more recent Rwandan experience,[9] few SORT-IT-like initiatives implemented by non-governmental organizations (NGOs) have been reported to date, although NGOs contribute to the development and expansion of local operational research capacity in their various intervention settings.

In 2017, Engenderhealth, a US-based NGO, decided to integrate operational research in its USAID-supported Fistula Care *Plus* program in the Democratic Republic of Congo (DRC) using a SORT-IT-like approach and building on the experience of previous SORT-IT participants.[16–18] This effort aimed to build research capacity among local program staff; support partner fistula repair hospitals to document good practices, and durably increase program effectiveness and efficiency through evidence-based decision-making for continuous quality improvement. The classic SORT-IT model was tailored to the needs of local teams, facilitators, and program requirements for feasibility, acceptability, and appropriateness. Between 2017 and 2021, two courses were conducted with adaptations to ensure safety following the emergence of the COVID-19 pandemic.

This paper describes the implementation of this flexible operational research training (FORT) course in the Fistula Care *Plus* Project in the DRC from 2017 to 2021. Lessons learned, including how to conduct such initiatives during a pandemic, may help other organizations interested in integrating operational research into their routine activities for greater effectiveness and increased country-level research capacity.

2 | MATERIALS AND METHODS

2.1 | The FORT approach—Context and setting

Since 2007, EngenderHealth has been working in the DRC to prevent and treat fistula through the USAID-supported Fistula Care (2007–13) and Fistula Care *Plus* (FC+, 2014–21) projects. DRC is one of the largest and most populous countries in Africa, with a high fertility rate (6.1 children per woman) and a concurrent high maternal mortality ratio of 693 (509–1010) per 100 000 live births.[19,20] An estimated 34 000 women live with female genital fistula in the DRC.[21]

The Fistula Care *Plus* project supports fistula treatment and support services in three hospitals: Saint Joseph Hospital in Kinshasa, HEAL Africa Hospital in Goma, and Hôpital Général de Reference in Panzi, which all participated in the two FORT-IT courses. From March 2014 through December 2020, the FC+ project supported 3406 surgical and non-surgical fistula repairs in the DRC and trained four fistula surgeons and more than 2352 other healthcare providers.

This documentation process included studies that obtained approval from the Ethics committee of the school of public health of the University of Kinshasa (Number ESP/CE/153/2020). Course participants also consented to participate in the study.

2.2 | Description of the FORT approach

FORT was designed to build operational research capacities among the local staff of FC+ supported sites. It builds on the classic SORT-IT model,[2] which was modified to cope with the program and epidemic contexts. It also borrows from the more recent blended SORT-IT approach.[7] Table 1 provides a comparison between the original SORT-IT model, the blended approach, and FORT. In FORT, course participants were identified by the sites and the research topics were proposed by participating teams. The protocol development workshop (SORT-IT Module 1) was either face-to-face (2017/18) or fully online (2020/21). The data management workshop (SORT-IT Module 2) was fully conducted online whereas the paper writing workshop (SORT-IT Module 3) was face-to-face (2017/18) or blended (2020/21). Between modules, teams had a weekly virtual meeting using Skype (2017/18), WhatsApp, or Zoom (2020/21) to discuss progress, and provide support or additional training to local research teams. Also, virtual working sessions were organized to reach consensus (for instance, on the agenda) or validate documents (database, report). The milestones were similar to those of the classic and the Blended SORT-IT (see Table 1) with few adjustments to the duration and submission requirements. Live virtual platforms such as Skype or Zoom were used instead of video lectures for more interactivity.

2.3 | Participant selection

Each participating site leadership was consulted to agree on the criteria for designating two to four site investigators. Those criteria included the involvement of the staff in the Fistula Care Plus program, interest in research, and the availability to attend all the required meetings pertaining to the training over a period of 10–12 months.

3 | RESULTS

3.1 | Process and outcomes of the course (2017–21)

Table 2 describes the process, adaptation, and outcomes of the two FORT courses conducted between 2017 and 2021. For both courses, the supported sites identified the research topics that were prioritized using a modified Delphi process.[22,23] Each site was

TABLE 1 Approach of the Flexible Operational Research Training (FORT) compared with SORT-IT[2,4] and Blended SORT-IT[7]

Steps	SORT-IT Model	Blended SORT-IT	FORT-IT Model
Selection of candidates	Strict selection criteria including a research question formulated by the participant	More flexible but adequate analysis Skills required for applicants	Participating sites identify site Principal Investigator, Co-Investigators and Data Clerk
Selection of research topic	Topic proposed by the participant and refined during the course	Topic proposed by the participant and refined during the course	Topics proposed by the sites and prioritized using a Delphi approach
Workshop 1	Protocol development (6 days face to face)	Protocol development through five steps online lectures (youtube videos) and remote mentoring	Protocol development (6 days face to face or virtually using Zoom platform)
Between Workshop 1 and Workshop 2	N/A (Workshops 1 and 2) are usually done back-to-back, 1 week followed by another week	Remote mentoring	Remote mentoring using WhatsApp group, weekly Zoom meetings and emails
Workshop 2	Data management and analysis (6 days face to face)	Data management and data analysis through two steps online lectures (youtube videos) and remote mentoring	Virtual data management workshop (using Zoom)
Between Workshop 2 and Workshop 3	Complete the study, enter the data into an electronic software package and analyze the data	Remote mentoring	Remote mentoring using WhatsApp group, weekly Zoom meetings and emails to support data collection, entry and cleaning
Workshop 3	Paper writing (6 days face to face)	Paper writing (7 days face to face)	Data analysis and paper writing (6 days face to face or virtually using Zoom platform)
After Workshop 3	Finalize draft paper and submit to peer-reviewed journal	Finalize draft paper and submit to peer-reviewed journal	Finalize draft paper and submit to peer-reviewed journal
Course duration	6–7 months	2–3 months	9–11 months
Milestone 1	*Three weeks after the end of protocol development workshop (module 1)*: Submission of the research protocol and the completed ethics forms	*After finishing step 5*: Submission of the research protocol and the completed ethics forms	*Four weeks after the end of protocol development workshop (module 1)*: Submission of the research protocol and tool for USAID clearance and ethics approval
Milestone 2	*Two weeks after the end of data management workshop (module 2)*: Submission of data documentation sheet, EpiData files and dummy tables to the module director and course coordinator	*After finishing step 5*: Submission of dummy tables/graphs to the mentor and course coordinator	*Data management workshop (module 2)*: co-validation of data collection instrument and dummy tables
Milestone 3	*Six weeks before the start of paper writing workshop (module 3)*: Submission of completed data sets and draft analysis to the module 2 facilitators and course coordinator	*Two weeks before the start of paper writing workshop (module 3)*: Submission of completed data sets and draft analysis to the mentor and course coordinator	*Two weeks before the start of paper writing workshop (module 3)*: co-validation of data analytical plan through virtual meeting
Milestone 4	*Four weeks after the end of paper writing workshop (module 3)*: Submission of a paper to a peer-reviewed journal	*Four weeks after the end of paper writing workshop (module 3)*: Submission of a paper to a peer-reviewed journal	*Four weeks after the end of paper writing workshop (module 3)*: Submission of a paper to USAID for clearance and then to a peer-reviewed journal

asked first to list potential research topics pertaining to its context and priorities. Then, research teams rated the topics using a scoring grid (from 1, less to 10, most) based on defined criteria including scientific relevance, availability of data at sites, accessibility of data at sites, feasibility of completion within 1 year, interest of the research team and potential impact of the research on practice. Finally, the top five topics that received higher ranking were discussed during a meeting to retain the best (one for each participating sites).

The 2017/18 course started in June 2017 and lasted 14 months. It included a face-to-face protocol development workshop in Kinshasa

TABLE 2 Process and outcomes of the two FORT-IT courses conducted between 2017 and 2021

Course steps	2017/18 OR Course	2020/21 OR Course
Research team identified	Four staff identified by site (1 PI, 2 Co-PI, 1 Data Clerk) and two additional staff from the NGO's office in Kinshasa. Two course facilitators identified and involved. *Period*: June 1 to 30, 2017	Four staff identified by site (1 PI, 2 Co-PI, 1 Data Clerk) and three additional staff from the NGO's office in Kinshasa forming the fourth group. Six course facilitators identified and involved. *Period*: April 1 to 30, 2020
Research topic identified	One topic agreed upon by the three supported sites using a modified Delphi approach. *Period*: June 20 to 30, 2017	Four topics prioritized out of nine initially identified using a modified Delphi approach. *Period*: May 1 to 31, 2020
Protocol development	Face-to-face protocol development workshop (7 days) in Kinshasa. Nine out of 12 expected people (75%) attended with one facilitator. *Period*: July 5 to 11, 2017	Virtual protocol development workshop with 13 out of 17 expected participants (76%) attended, with four facilitators. *Period*: June 3 to 5, 2020
Obtaining ethics approval	Finalization of research protocol and data collection tools, obtaining clearance from USAID and submission to Ethics committee in DRC *Period*: July 15 to September 30, 2017	Finalization of research protocol and data collection tools, obtaining clearance from USAID and submission to Ethics committee in DRC. *Period*: June 10 to July 31, 2020
Data management	Remote support (via emails) to develop and test data collection tool using Epidata Software. *Period*: September 1 to 30, 2017	Virtual workshop (using Zoom platform) with 14 out of 17 (82%) expected participants (and three facilitators). *Period*: August 6 to 7, 2020
Data collection, entry and cleaning	Remote mentoring using WhatsApp group, weekly Zoom meetings and emails to support data collection, entry and cleaning. Finalization of data entry, co-development and validation of data analytical plan. *Period*: October 1, 2017 to March 31, 2018	Provision of tablets to the sites, development and testing of the data set using Kobotoolbox, weekly follow-up meeting about data entry and cleaning. Collection and management of qualitative data. Finalization of data entry, co-development and validation of data analytical plan. *Period*: August 15, 2020 to January 31, 2021
Data analysis and scientific paper writing	Face-to-face data analysis and scientific writing workshop in Goma. 10 out of 12 expected people (83%) attended with one facilitator. *Period*: May 28, to June 2, 2018	Blended data analysis and scientific writing workshop in Kinshasa including 16 out of 17 expected participants (94%). 15 participants working face to face in Kinshasa and two attending virtually (via Zoom platform). Six facilitators supported the workshop (four face to face and two virtually). One participant came from the Ministry of Health. *Period*: February 8 to 13, 2021 (7 days)
Submission of manuscript to peer-reviewed journal	Finalization of the draft manuscript through email exchanges, development of abstract and poster, obtaining feedback from Engenderhealth and USAID, translation into English, editing and submission to peer-reviewed journal. *Period*: June 5 to July 31, 2018	Peer review of draft manuscripts among working groups, finalization meeting (Zoom platform), obtaining feedback from EngenderHealth and USAID, translation into English, editing and submission to peer-reviewed journals. *Period*: February 15 to March 31, 2021
Estimated duration	14 months	12 months
Outcomes		
Manuscripts submitted	1	4
FORT-related manuscripts published	1	0 (in process)
Abstracts presented	2	1
Publications after first FORT course	5	0 (in process)

followed by a virtual data management module (Module 2) delivered through a series of online meetings and a face-to-face data analysis and paper writing module (Module 3) conducted in the city of Goma.

The second course (2020/21) started in April 2020 for 13 months in a context where the Ebola outbreak and the COVID-19 pandemic were ongoing in the DRC, with the latter rapidly spreading in Africa and resulting in quarantine, border closures, and travel bans.[24] Because of the COVID-19 pandemic, the protocol development (Module 1) and data management (Module 2) modules were conducted entirely online using the Zoom virtual platform. Data were collected using KoboToolbox on tablets that were provided to participating sites. The data analysis and paper writing module (Module 3)

was conducted as a blended workshop with a first group gathering in Kinshasa while other participants fully attended the workshop virtually (Zoom platform) because of COVID-19 travel restrictions. Each day, a Zoom link was shared and a video conferencing system allowed full participation of virtual participants in presentations, discussions, group work, and plenary discussions.

For both courses, a team peer-review process was used along with virtual working sessions via Zoom to finalize manuscripts that were translated into English, edited, and submitted to the targeted peer-reviewed journals after EngenderHealth and USAID review.

The two courses resulted in six scientific manuscripts submitted to peer-reviewed journals (four were already published at the time of this paper's writing), and two presentations at international conferences by local researchers. Through their subsequent independent research activities, participants who completed the first course in 2018 managed to publish five additional papers (Box 1).

3.2 | Evaluation of the courses

Twelve people participated in the first course, including seven women (58%), and 17 took part in the second one (47% women). Two women from the first course did not participate in the second one. Most participants for both courses were medical doctors (8 [67%] and 12 [71%], respectively) who had worked for 10 years on average at the supported hospitals. Overall, nine facilitators were involved in the two courses. Three facilitators were used in the first course (including two methodologic experts and one data manager/analyst) and six facilitators were involved in the second course (four methodologic experts and two data managers/analysts).

We assessed how much participants felt their skills improved on a scale of 1 to 10 (1 for lowest improvement and 10 for highest improvement) for selected areas of the course (Table 3). Overall, mean skill improvement ranged from 6.5 to 7.6 for the first course and slightly increased during the second course, ranging from 7.1 to 8.0. Most participants reported having gained new skills in developing research protocols, collecting, managing, analyzing data, and developing research manuscripts. Participants found the course participatory, flexible, and adapted to their needs (Box 1). The close support from EngenderHealth and facilitators was also appreciated. The short duration of workshops, internet issues, and regular changes in training plans due to program constraints were among the weaknesses reported. The main challenges to course sustainability reported were the lack of dedicated time and resources for research activities, the inability for participants to replicate the training by themselves, and the limited data management and analytical skills (Box 2).

3.3 | Costs and funding

The Fistula Care *Plus* Project fully funded the FORT. Costs included fees for the course facilitators, training costs for all face-to-face

BOX 1 Topics of operational research conducted on female genital fistula within the Fistula Care *Plus* Project in the DRC between 2017 and 2021

1. Frequency and management of non-obstetric fistula in the Democratic Republic of Congo: experience from the Fistula Care Plus project. https://pubmed.ncbi.nlm.nih.gov/32223055/
2. Factors associated with surgical repair success of female genital fistula in the Democratic Republic of Congo: Experiences of the Fistula Care Plus Project, 2017–19. https://pubmed.ncbi.nlm.nih.gov/35749231/
3. Integrating Client Tracker Tool Into Fistula Management: Experience From the Fistula Care Plus Project in the Democratic Republic of Congo, 2017–19. https://pubmed.ncbi.nlm.nih.gov/35757601/Factors Associated With Persistent Urinary Incontinence Among Women Undergoing Female Genital Fistula Surgery in the Democratic Republic of Congo From 2017 to 2019. https://pubmed.ncbi.nlm.nih.gov/35814834/
4. Surgical prognosis of female genital fistula according to the level of complexity in the DRC from 2017 to 2021.
5. Capacity Building in Operational Research On Obstetric Fistula: Experience in the Democratic Republic of Congo, 2017 to 2021.

Publications made by course participants since completion of the first course in 2018

1. Maroyi R, Shahid U, Vangaveti V, Rane A, Mukwege D. Obstetric vesico-vaginal fistulas: midvaginal and juxtacervical fistula repair outcomes in the Democratic Republic of Congo. Int J Gynecol Obstet. 2020 Nov 8. 10.1002/ijgo.13472. Epub ahead of print. PMID: 33164206.
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TABLE 3 Evaluation of the two FORT courses conducted under the Fistula Care *Plus* Project in the Democratic Republic of Congo from 2017 to 2021[a]

Participant characteristics	First course	Second course
Age, year	44.7 ± 3.9	42.0 ± 2.0
Mean years of experience at site (SD)	10.1 ± 3.2	10.2 ± 1.3
Gender		
Female	7 (58.3)	8 (47.1)
Male	5 (41.7)	9 (52.9)
Participating site		
Engenderhealth Kinshasa Office	2 (16.7)	3 (17.6)
Heal Africa Hospital	4 (33.3)	5 (29.4)
National Reproductive Health Program	0 (0.0)	1 (5.9)
Panzi Hospital	3 (25.0)	6 (35.3)
Saint Joseph Hospital	3 (25.0)	2 (11.8)
Profession		
Data manager	2 (16.7)	3 (17.6)
Medical doctor	8 (66.6)	12 (70.6)
Midwife/Nurse	2 (16.7)	2 (11.8)
Participants perceived improvements (mean on a scale of 1–10)		
Confidence in using the knowledge gained during the training	7.6 ± 0.7	8.0 ± 0.1
Ease in carrying out the literature review after the training	7.2 ± 0.5	7.6 ± 0.4
Ease in managing references after litterature review	7.1 ± 0.6	7.4 ± 0.4
Ease in managing and analyzing data after the training	7.0 ± 0.5	7.6 ± 0.3
Ease in writing research protocol after the training	6.5 ± 0.5	7.1 ± 0.5
Ease in writing a scientific paper after the training	7.4 ± 0.6	7.6 ± 0.4

[a]Data are presented as mean ± standard deviation or as number (percentage).

training sessions (transport and accommodation, meals, internet and phone credit costs for facilitators for remote support and virtual meetings, travel for presentations at international conferences, and publication fees). Participating sites were also provided with tablets during the second course to facilitate data entry. The EngenderHealth office in Kinshasa and partner hospitals covered data collection and ethics submission fees and administrative and logistical support for face-to-face training. No salary was paid to participants for attending the courses. The direct costs of the first FORT course were approximately US$ 38 823 and that of the second course was US$ 67 569 (US$ 106 392 in total). This represents a cost of US$ 3669 per participant trained and US$ 17 732 per research conducted and scientific paper developed.

4 | DISCUSSION

The FORT implementation experience suggests several implications with regard to the original SORT-IT or the Blended SORT-IT models.

First, SORT-IT and Blended SORT-IT use rigorous and competitive selection criteria to select individuals, usually from large target audiences.[6,9] Likewise, participants in the IORT are identified through rigorous selection criteria.[10] In contrast, the FORT selects local research teams composed of healthcare workers from participating sites or services with different research backgrounds. Therefore, FORT appears to be much adapted to team-building initiatives within programs and services.

Second, the research topics in the FORT were identified and prioritized by local teams according to their needs. In the classic SORT-IT, participants identify a research topic that is later refined during the course. More focused SORT-IT courses have been initiated on specific research topics (e.g. neglected tropical diseases, Ebola, antimicrobial resistance) where participants need to submit a research proposal fitting the course topic.[25–27] In the IORT conducted in Rwanda, participants provided their topic when applying to the first course but during subsequent courses, the organizing NGO provided a list of topics from which selected candidates had

BOX 2 Strengths, weaknesses, and challenges to sustainability of FORT Courses conducted in the Democratic Republic of Congo from 2017 to 2021

Strengths

- Participatory approach of the course
- Availability of facilitators during workshops and remotely -
- Flexibility of the training (adaptability to local agendas, mix of face-to-face and remote coaching) -
- Training approach adapted to the needs of the sites' personnel -
- Capacity building of sites' personnel in scientific writing -
- Support from EngenderHealth (logistics and financing) -
- Integration of operational research culture in fistula repair sites

Weaknesses

- Short duration of the training sessions (workshops) -
- Low internet connectivity limiting good participation in trainings -
- Irregular training sessions -
- Inability to write a manuscript alone

Challenges to sustainability

- Lack of time dedicated to research at sites -
- Limited access to data -
- Low capability in conducting data management and analysis without supervision -
- Lack of human and financial resources dedicated to research at sites

to choose.[11] The focused SORT-IT and IORT might be perceived as approaches that limit participants' autonomy and decision space and interpreted as a top-down approach that primarily advances the organizer's pre-defined research agenda.

Conversely, FORT offers a bottom-up approach that brings teams from different sites to achieve consensus on common research gaps. Also, because no funding was provided to participants to conduct the research, any activities they undertook were motivated by felt needs, not NGO requirements or resources. Such approaches might foster greater ownership and support a more sustainable and institutionalized "research culture."

Third, the performance assessment of classic SORT-IT courses can apply to the FORT if the assessment unit becomes the research team instead of individuals.[6] For instance, in the first FORT course, the research team worked on one research topic, which resulted in one published paper and two international conference presentations. The second course resulted in five papers written by four research teams. Therefore, FORT and other SORT-IT models might not target the same training goal. FORT seeks to build a local research team that might initiate and conduct a research project whereas others focus on training individuals who will achieve an expected scientific publication output. Bringing different but related sites and program implementers together may strengthen professional networks and develop a shared sense of purpose.

Given dynamic implementation environments, flexibility appeared as an enabler that implementers and organizers must be ready to embrace. Adapting the training course delivery to rapidly changing epidemiologic contexts, such as the ongoing COVID-19 and Ebola outbreaks, resulted in successful implementation. For instance, FORT enabled adaptation to the time or agenda constraints frequently experienced in program implementation. The course was flexible enough to be delivered during the COVID-19 pandemic, which was characterized by social distancing, travel restrictions, border closures, and uncertainty around COVID-19 testing. Virtual workshops for all participating sites, separate working sessions by site, and blended workshops were integrated into the process to avoid delays. Also, WhatsApp and Zoom were introduced into the classic modules for close mentoring either on a facilitator-site basis, one-to-one basis, or with all staff of the participating sites. Therefore, in contexts where epidemics continue to evolve, FORT might be a cost-effective alternative to the existing models, especially for small-scale capacity-building programs. It is worth noting, however, that even the classic SORT-IT has developed fully online versions where mentors participate virtually while participants are gathered in one place.[28] We found that four out of six (67%) of participants in the Blended SORT-IT developed and submitted a manuscript to a peer-reviewed journal within 4 weeks of completing the training.[7] SORT-IT usually acknowledges a publication rate higher than 80% among individual participants,[29] whereas in FORT, outcomes are team-based. However, Blended SORT-IT and SORT-IT do not report about conference presentations.

Flexibility in the recruitment criteria increased the participation of women in our setting, and is likely to do the same elsewhere given the gender imbalance in research training and capacity in many settings. Participants to FORT were not selected for their previous research background as done in other existing models but instead selection was based on their availability and motivation. This made FORT an equitable approach for reducing gaps in research capacity and output for people and contexts where classic operational research capacity building models cannot be implemented.

FORT could be entirely delivered in French, the local professional language, which enabled the full participation of local teams. This flexibility reduced the language barrier faced by Francophone countries where there is a shortage of scientific publications and research mentors compared with Anglophones. Language barriers have been a significant challenge limiting Francophone candidates' participation in the classic SORT-IT courses.[7] Finally, FORT sought to overcome any outstanding language concerns by providing translation and editing services after the completion of courses.

Several challenges have been identified to the FORT approach that merit close attention. First, with a mean duration of 13 months from topic identification to manuscript submission, FORT requires a longer commitment than the classic SORT-IT and blended SORT-IT but there is room to reduce the time between modules. Second, despite bringing participants together as a team to develop protocols and manuscripts, FORT failed to uniformly develop the full research capacities of individuals composing each research team. Therefore, some participants may be less equipped than others to serve as a mentor for similar subsequent training. Notably, previous participants in classic SORT-IT courses have often successfully served as mentors in regional or national courses,[7] contributing to further local research capacity building. Third, FORT is limited in terms of the number of publications per course as manuscripts are assigned to teams instead of individuals and the number of teams per course is limited.

In conclusion, the integration of operational research initiatives and capacity building in fistula care programs in the DRC using the FORT model was feasible, efficient, and successful. The course trained 17 participants and resulted in six manuscripts submitted to peer-reviewed journals and five additional papers published by course participants in the 2 years following the first course. Scaling up the use of FORT will require dedicated personnel, time, and funding of operational research within program budgets and participating sites. Future courses should integrate training on some basic skills such as reference management, data management, and analysis software for research teams to make them stronger.

AUTHOR CONTRIBUTIONS

The study protocol was developed by AD and reviewed by VT and BSC. Data collection was ensured by AD, BSC, SS, FMG, DK, and AD, and VT performed the data analysis. All authors were involved with interpretation. The first draft of the manuscript was written by AD, BSC, SS, DK, and KK and it was critically reviewed by VT, PB, DFB, and MMM. All authors have read and agreed to the final version of this manuscript.

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CONFLICT OF INTERESTS

The authors declare that they have no competing interest.

DATA AVAILABILITY STATEMENT

Research data are not shared.

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