

ORIGINAL RESEARCH

A cross-sectional survey investigating the impact of COVID-19 on surgery training at teaching hospitals accredited by the College of Surgeons of East, Central and Southern Africa

Samuel Wanjara¹, Robert K. Parker^{2,3}, Davies Cheruiyot¹, Nobert Kipkoech⁴, Mark Lutomia⁵, Peter R. Oduor⁵, Mathenge Nduhiu⁶, Michael Mwachiro²

¹Department of Surgery, Nakuru Level V Hospital, Nakuru, Kenya

²Department of Surgery, Tenwek Hospital, Bomet, Kenya

³Department of Surgery, Brown University, Providence, RI, USA

⁴Department of Surgery, AIC Kijabe Hospital, Kijabe, Kenya

⁵Department of Surgery, Egerton University, Njoro, Kenya

⁶Department of Surgery, Nyeri County Referral Hospital, Nyeri, Kenya

Correspondence: Dr Samuel Wanjara (gla.sawa@gmail.com)

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Abstract

Background

Globally, clinical training programmes have adopted several strategies in response to the evolving COVID-19 pandemic, including reorganizing the provision of care and safeguarding the well-being of trainees. This study aimed to describe the effects of the COVID-19 pandemic on surgical training programmes in Africa.

Methods

We conducted a cross-sectional survey through an online questionnaire distributed via email to all College of Surgeons of East, Central and Southern Africa (COSECSA) trainees and faculty. Input regarding experiences with the COVID-19 pandemic was sought, including perceptions about personal protective equipment (PPE), organizational changes impacting training, use of e-learning platforms, reactions to the pandemic, and measures taken by institutions to combat COVID-19. Descriptive statistics were utilized, along with comparisons between faculty and trainee experiences. *P* values ≤ 0.05 were considered statistically significant.

Results

Including 78 faculty members (31.6%), 247 participants completed the survey, and 175 believed they had been supplied with sufficient information regarding COVID-19 and the relevant PPE (71.7% of 244 who responded to this questionnaire item). The PPE components that were reported as most available were face masks ($n=239$, 96.8%), gloves ($n=236$, 95.5%), and body gowns ($n=178$, 72.1%). Most of the respondents ($n=212$, 85.8%) had learning reorganized at their centres due to the pandemic. Forty-two participants (17.0%) reported being exposed to COVID-19. Two respondents (0.8%) reported testing positive for COVID-19, but both were asymptomatic. About half of the respondents ($n=122$, 49.4%) used the existing COSECSA e-learning platform in the same manner as before the pandemic, and 174 participants (70.4%) suggested that COSECSA should implement a different examination format given the circumstances.

Conclusions

COSECSA training centres have adopted measures to combat the COVID-19 pandemic. Despite this, the pandemic has already adversely affected staff and patients. The centres should increase access to information about COVID-19 and enhance infection protection practices. Likewise, COSECSA should enrich online educational platforms and consider alternative examination formats.

Keywords: COVID-19, surgical residency, surgery training, personal protective equipment, e-learning, Africa

Introduction

The COVID-19 pandemic continues to unfold globally. In Africa, as of 30 June 2021, over 5 million individuals had already been infected with the virus, accompanied by a death rate of 1.3%.^{[1],[2]} In fact, incidence trends, along with consideration of the weak healthcare systems on the continent, have informed projections suggesting Africa as the next frontier of the pandemic.^{[3],[4]} The World Health Organization and numerous professional healthcare bodies have consequently issued guidelines and protocols to help mitigate these effects, mobilize healthcare, and reduce further spread of the disease.^[5] The global community continues to document and share experiences to learn and adjust guidelines where necessary.^{[6],[7]}

Worldwide, surgical training programmes have reorganized to respond to the local effects of the pandemic with regard to provision of care and safeguarding the well-being of trainees and other healthcare workers.^{[6],[8]} Trainees have assumed roles beyond the scope of their routine educational programmes and have adapted to temporary duties and schedules. This is aimed at maximizing infection control while providing optimal patient care.^{[7],[8]} Additionally, training programmes have endorsed alternative and

creative methods to deliver their curriculums. This is partly because social distancing has led to limited or prohibited direct contact. Safeguarding the mental health of trainees has also been a key endeavour.^[9] The actual short-term and long-term effects on programmes and their trainees, however, remain unknown. For example, the American Board of Surgery has expressed the need to exempt trainees from certain requirements.^[8]

The pandemic has also had ravaging effects on healthcare systems, with resources being stretched to their limits and gaps severely exposed where they exist.^[10] This has necessitated the prioritization of healthcare services. Services that are not deemed urgent have been suspended, with emphasis placed on optimizing more critical care components and infection control practices.^[11] The downsides of these changes might be observed in the long-term care of patients with chronic noncommunicable diseases.^{[10],[12]} Nevertheless, novel ideas, like telephone consultations, have been utilized to address the care of this patient population.

The adoption of online tools has enabled the uninterrupted delivery of patient care, training, information dissemination, and assessments of interventions.^{[8],[13]} Such tools have indeed facilitated social distancing protocols,

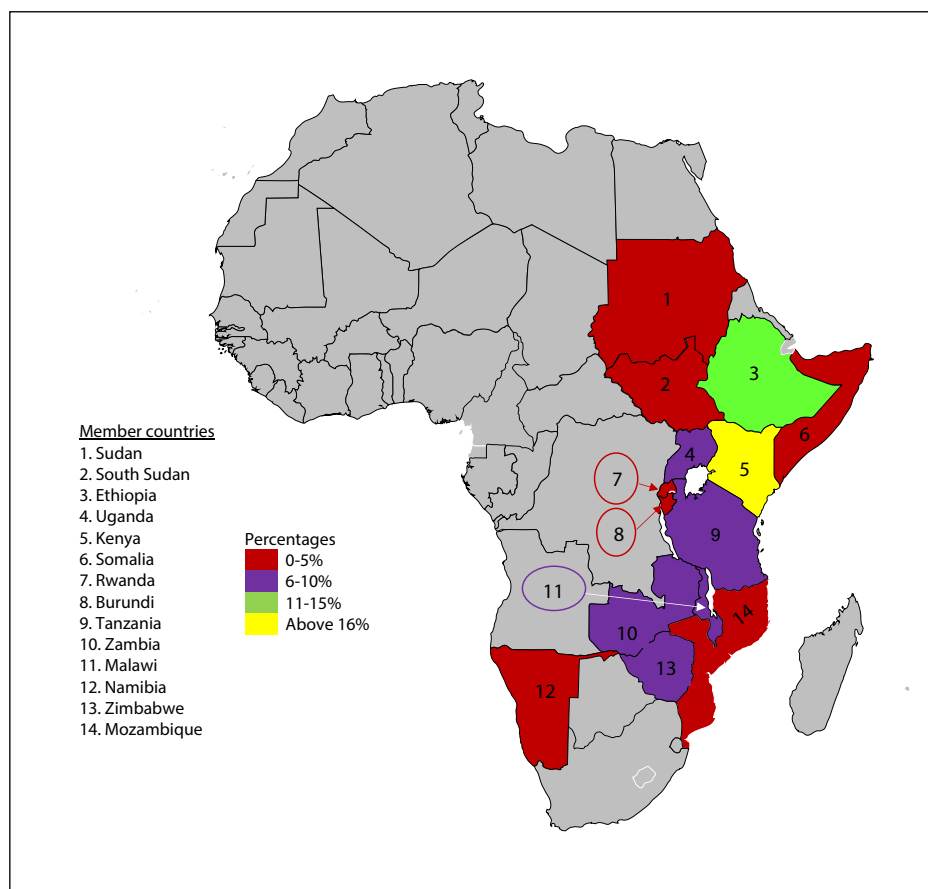


Figure 1. Programme countries

The distribution of the respondents among the member countries of the College of Surgeons of East, Central and Southern Africa. An additional 8.1% of the respondents chose the "Other" option apart from the list of countries given in the survey.

Table 1. Demographics and programme details (N=247)

Category	n (%)
Age, years	
26-30	45 (18.2)
31-35	89 (36.0)
36-40	55 (22.3)
Above 40	57 (23.1)
Blank	1 (0.4)
Gender	
Male	201 (81.4)
Female	45 (18.2)
Blank	1 (0.4)
Marital status	
Married	178 (72.1)
Single	61 (24.7)
Divorced	3 (1.2)
Prefer not to say	5 (2.0)
Lives with relatives	
Yes	162 (65.6)
No	82 (33.2)
Blank	3 (1.2)
<i>Continued</i>	

continued learning, and social interactions. They could also form an important pillar of future healthcare delivery systems and training programmes.[6],[8] They have also enhanced collaborative research, thereby promising to improve patient care.[14]

The College of Surgeons of East, Central and Southern Africa (COSECSA) provides surgical training at various centres across its 14 member countries. By training surgeons in the sub-Saharan region, COSECSA has cemented its role globally in terms of the provision of high standards of surgical care.[15] However, the impact of the COVID-19 pandemic on surgical training in the region has not been elaborately described and documented. This study aimed to describe the effects of the COVID-19 pandemic at COSECSA training centres across all COSECSA member countries, as well as the preparedness of these centres to manage difficulties associated with the pandemic.

Methods

We conducted a cross-sectional survey through an online questionnaire distributed via email to 1259 COSECSA trainees and faculty addresses on file with the COSECSA secretariat. Current trainees and faculty of the COSECSA Membership of the College of Surgeons (MCS) or Fellow-

Table 1. Continued

Category	n (%)
Level and year of study	
MCS 1	18 (7.3)
MCS 2	21 (8.5)
FCS 3	52 (21.1)
FCS 4	34 (13.8)
FCS 5	35 (14.2)
FCS 6	4 (1.6)
Faculty	74 (30.0)
Blank	9 (3.6)
Programme	
Faculty	78 (31.6)
MCS	36 (14.6)
FCS Ear, Nose, and Throat	1 (0.4)
FCS General Surgery	58 (23.5)
FCS Neurosurgery	12 (4.9)
FCS Orthopaedic	34 (13.8)
FCS Paediatric	8 (3.2)
FCS Plastic and Reconstructive Surgery	8 (3.2)
FCS Urology	11 (4.5)
Blank	1 (0.4)
Hospital type	
Government	155 (62.8)
Mission	78 (31.6)
Private	14 (5.7)

FCS, Fellowship of the College of Surgeons (of East, Central and Southern Africa); MCS, Membership of the College of Surgeons (of East, Central and Southern Africa)

ship of the College of Surgeons (FCS) programmes were eligible. COSECSA MCS or FCS trainees were ineligible if they were not training at a COSECSA-accredited training centre. The respondents were informed of the nature and purpose of the study and were required to give their consent before participating in the study. The questionnaire comprised 7 sections with both multiple-choice and open-ended questions. Questions were designed to ascertain demographics and the participants' experiences with COVID-19 at their training centres, including the provision of personal protective equipment (PPE), the reorganization of learning activities and web-based learning, patient outcomes, participants' health and well-being (participants were asked if they had experienced any of the following emotions: guilt, insomnia, anxiety, helplessness, exhaustion, burnout, fatigue, or disori-

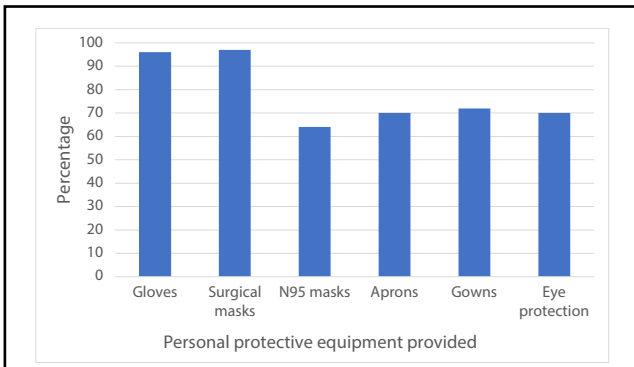


Figure 2. Provision of personal protective equipment

The commonest personal protective equipment items provided at the various training centres, as indicated by the respondents.

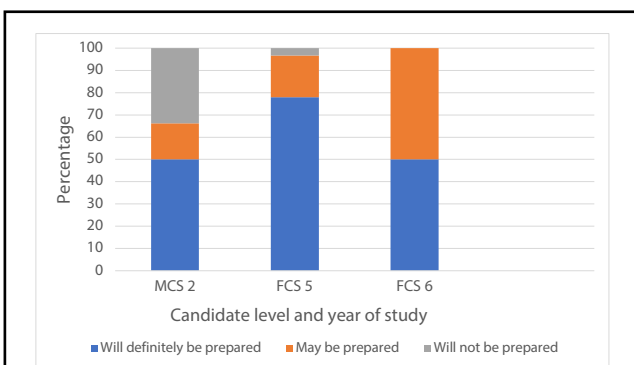


Figure 3. Examination candidate preparedness levels

Preparedness levels among examination candidates for the year 2020.

FCS, candidates for the Fellowship of the College of Surgeons (of East, Central and Southern Africa) credential; MCS, candidates for the Membership of the College of Surgeons (of East, Central and Southern Africa) credential

entation), and perceptions about necessary changes to training and exams. Responses were compared among faculty and trainees. For the questions regarding the mental health of participants, comparisons were performed between participants who experienced 2 or more of the listed symptoms and those who reported 1 or 0 symptoms. Data were exported to Excel (Microsoft Corp., Redmond, WA, USA) spreadsheets and analysed with Stata, version 16 (StataCorp, College Station, TX, USA). Comparisons were made using chi-square analysis for categorical variables. P values ≤ 0.05 were considered statistically significant. The COSECSA institutional review board approved this study.

Results

We received 274 responses (response rate, 21.8%). [Table 1](#) shows the demographics of the respondents and their programme details. [Figure 1](#) displays the countries in which the participants were trainees or faculty during the study period. Most participants ($n=211$, 85.4%) indicated that training on infection prevention practices was organized at their institutions during the pandemic; 152 of 244 respondents to the applicable questionnaire item (62.3%) had participated in such training. [Table 2](#) summarizes the participants' responses regarding pandemic preparedness at their institutions.

Table 2. Preparedness components (N=247)

Questionnaire item	n (%)
Supplied with enough information on COVID-19	
Yes	175 (70.9)
No	61 (24.7)
I do not know	8 (3.2)
Blank	3 (1.2)
Staff and patients required to wear masks	
Yes, both staff and patients	197 (79.8)
Yes, only staff	43 (17.4)
No	3 (1.2)
I do not know	1 (0.4)
Blank	3 (1.2)
Staff mask compliance	
Always	136 (55.1)
Sometimes	106 (42.9)
Never	1 (0.4)
Blank	4 (1.6)
Patient mask compliance	
Always	80 (32.4)
Sometimes	153 (61.9)
Rarely	6 (2.4)
Never	1 (0.4)
Blank	7 (2.8)

Continued

[Figure 2](#) illustrates the reported provision of PPE at the training centres. About half of the participants ($n=122$ of 246, 49.6%) indicated that they experienced less than 3 instances wherein a PPE component was not available during the pandemic. Trainees ($n=67$ of 143 who responded to this item, 46.9%) were more likely than faculty ($n=13$ of 59 who responded to this item, 22.0%) to report unavailability of a PPE component ($P=0.01$).

Most participants ($n=212$, 85.8%) had learning reorganized at their centres; no significant difference was noted between faculty ($n=67$ of 78, 85.9%) and trainee ($n=145$ of 169, 85.8%) responses in this regard ($P=0.98$). [Table 3](#) summarizes some of the strategies for surgical service reorganization.

The effects of COVID-19 at COSECSA training centres pertaining to personal health, training, and patient outcomes are shown in [Table 4](#) and [Table 5](#). As shown in [Table 5](#), 42 participants (17.0%) reported being exposed to COVID-19

Table 2. Continued

Questionnaire item	n (%)
Instances when a component of recommended PPE was not available when needed	
≥3	80 (32.4)
<3	122 (49.4)
I do not know	44 (17.8)
Blank	1 (0.4)
Institutional training on infection prevention practices	
Yes	211 (85.4)
No	29 (11.7)
I do not know	7 (2.8)
Participated in training on infection prevention practices	
Yes	152 (61.5)
No	92 (37.2)
Blank	3 (1.2)
Learning reorganized	
Yes	212 (85.8)
No	35 (14.2)
Departmental briefings/updates	
>10	40 (16.2)
3-10	90 (36.4)
<3	116 (47.0)
Blank	1 (0.4)

PPE, personal protective equipment

but remained uninfected. Most participants (n=186 of 246, 75.6%) had not been tested for COVID-19. We did not find any significant difference between the proportions of faculty (n=20 of 78, 25.6%) and trainees (n=33 of 169, 19.5%) taking on roles outside their usual department (P=0.25).

Regarding the emotional experiences queried (guilt, insomnia, anxiety, helplessness, exhaustion, burnout, fatigue, or disorientation): compared with participants who had not cared for COVID-19 patients (n=51 of 145, 35.2%), significantly more participants who had cared for COVID-19 patients (n=50 of 84, 59.5%) reported experiencing at least 2 of these manifestations (P=0.004). Characteristics that were also associated with a significantly higher proportion of participants experiencing at least 2 of the listed emotional manifestations included trainee status (n=87 of 169, 51.5%) vs faculty status (n=29 of 78, 37.2%) (P=0.04), female sex (29 of 45, 64.4%) vs male (n=87 of 201, 43.3%) (P<0.001), not residing with relatives (n=46 of 82, 56.1%) vs residing with relatives

Table 3. Reorganization of surgical services (N=247)

Questionnaire item	n (%)
Specific team to handle COVID-19 cases	
Yes	136 (55.1)
No	97 (39.3)
I do not know	13 (5.3)
Blank	1 (0.4)
Specific operation room for COVID-19 cases	
Yes	106 (42.9)
No	128 (51.8)
I do not know	12 (4.9)
Blank	1 (0.4)
Checklist for operations on COVID-19 cases	
Yes	73 (29.6)
No	125 (50.6)
I do not know	46 (18.6)
Blank	3 (1.2)
Guidelines for essential surgical cases available	
Yes	103 (41.7)
No	142 (57.5)
Blank	2 (0.8)

(n=69 of 162, 42.6%) (P=0.046), and experience with a lack of PPE at least 3 times during the pandemic (n=59 of 80, 73.8%) vs others (n=47 of 122, 38.5%) (P<0.001). Factors associated with participants experiencing at least 2 of the queried manifestations also included a perceived lack of information about COVID-19 (n=37 of 61, 60.7%) vs the perception of sufficient availability of COVID-19 information (n=75 of 175, 42.9%) (P=0.02), a workplace environment lacking clear COVID-19 guidelines (n=75 of 142, 52.8%) vs a workplace with clear COVID-19 guidelines (n=40 of 103, 38.8%) (P=0.03), and lack of COVID-19 training provided or available at the workplace (n=19 of 29, 65.5%) vs provision or availability of COVID-19 training at the workplace (n=95 of 211, 45.0%) (P=0.04).

Just over half of the respondents (n=126 of 245, 51.4%) felt that their surgical training had become worse since the declaration of the pandemic. One of the participants stated, "training goes on as scheduled but under much more stress and distraction". Another participant stated, "[It is now] hard to coordinate and mobilize. No hands-on [experience] for residents", while another added, "I am faculty, so we teach via Zoom app". A majority of participants also indicated

Table 4. Effects of the pandemic (N=247)

Questionnaire item	n (%)
Provided direct care to a confirmed or suspected COVID-19 patients	
Yes	84 (34.0)
No	145 (58.7)
I do not know	15 (6.1)
Blank	3 (1.2)
Taken roles outside usual department or routine	
Yes	53 (21.5)
No	194 (78.5)
Surgical training during the pandemic	
More vibrant	10 (4.0)
No change	82 (33.2)
Worse	126 (51.0)
Others	27 (10.9)
Blank	2 (0.8)
Effect on outcomes of patients other than COVID-19 patients	
Improved	7 (2.8)
No change	67 (27.1)
Worse	146 (59.1)
I do not know	25 (10.1)
Blank	2 (0.8)

Continued

that they would not manage to log the required minimum number of cases in their surgical logbooks because of the pandemic. Of 245 respondents, 146 (59.6%) indicated that the pandemic was likely to worsen outcomes for patients, including those without COVID-19, at their centres.

The strategies employed by COSECSA and its faculty and trainees towards mitigating the effects of the pandemic on learning and examinations are illustrated in [Table 6](#). Half of the respondents (n=122 of 244, 50.0%) had been using the existing COSECSA e-learning platform during the pandemic in the same manner as usual, and 51 (20.9%) had been using it more than usual. Significantly more trainees (n=132 of 167 who responded to this item, 79.0%) than faculty (n=40 of 77, 51.9%) reported using e-learning tools ($P<0.001$). In terms of the available platforms, 32 of 169 trainees (18.9%) reported using the *Surgery in Africa* journal club, while *Surgical Foundations in Basic Science* was used by 31 of 39 eligible MCS participants (79.5%). Additionally, 216 participants (87.4%) utilized webinars or online meetings, and 118 par-

Table 4. Continued

Questionnaire item	n (%)
Usual cases of curative oncological surgeries postponed	
No change	92 (37.2)
<25%	49 (19.8)
26%-50%	40 (16.2)
51%-90%	26 (10.5)
>90%	24 (9.7)
100%	9 (3.6)
Blank	7 (2.8)
Effect of the pandemic on surgical case logbook	
Will log more cases	3 (1.2)
Will log fewer cases	132 (53.4)
Will not manage to log minimum cases required	2 (0.8)
No effect	38 (15.4)
I do not know	6 (2.4)
Not a trainee	62 (25.1)
Blank	4 (1.6)

ticipants (47.8%) had interacted with patients via telephone or telemedicine during the COVID-19 pandemic.

[Figure 3](#) summarizes self-reported candidate examination preparedness among participants who were planning to take examinations in 2020. Nearly three-quarters of participants (n=174 of 243 who responded to this item, 71.6%) believed that COSECSA should propose a different examination format for the year 2020. Faculty (n=35 of 77 who responded to this item, 45.5%) were more likely than trainees (n=51 of 165 who responded to this item, 30.9%) to report the need to extend the duration of COSECSA training due to the pandemic ($P=0.03$).

Discussion

COSECSA training centres have instituted several recommended measures to both prevent adverse effects from the COVID-19 pandemic and to safeguard the well-being of staff and patients. Nevertheless, the pandemic has had substantial impacts on training and the health of personnel at training centres. COSECSA training programmes have employed existing technology to reorganize and ensure the continuity of both quality training and examinations.

We found that, overall, PPE and information regarding COVID-19 were provided at the training centres in a timely and reliable manner for most respondents. However, the experiences of the participants varied, with diverse reports concerning adequate access to PPE, training regard-

Table 5. Screening and testing (N=247)

Questionnaire item	n (%)
County or district screening the public for COVID-19	
Yes	170 (68.8)
No	63 (25.5)
I do not know	11 (4.5)
Blank	3 (1.2)
Facility screening patients and visitors for COVID-19	
Yes	196 (79.4)
No	42 (17.0)
I do not know	5 (2.0)
Blank	4 (1.6)
Facility screening staff for COVID-19	
Yes	160 (64.8)
No	82 (33.2)
Blank	5 (2.0)
Tested for COVID-19	
Yes, PCR	44 (17.8)
Yes, serology	11 (4.5)
Yes, PCR and serology	5 (2.0)
No	186 (75.3)
(Excluded responses)	1 (0.4)
COVID-19 disease status	
Infected, symptomatic	2 (0.8)
Not infected, exposed	42 (17.0)
Not infected, not exposed	79 (32.0)
I do not know	122 (49.4)
Blank	2 (0.8)

PCR, polymerase chain reaction

ing COVID-19, and compliance with mask-wearing recommendations. Reported compliance to guidelines on the use of PPE—wearing masks, for example—was not optimal among staff and patients at many hospitals represented in the survey. According to the World Health Organization’s strategic preparedness and response plan, infection prevention and control strategies at the local level are critical for optimizing COVID-19 prevention.[16] Therefore, appropriate provision of both the correct information and PPE should be distributed among surgical teams to curtail the risk of transmission of COVID-19 and to enhance resource effectiveness.[6],[12],[13]

Table 6. Learning and examinations

Component of learning	n (%)
Use of existing e-learning platform during the pandemic (N=247)	
Yes, same as usual	122 (49.4)
Yes, more than usual	51 (20.6)
No	69 (27.9)
Maybe	2 (0.8)
Blank	3 (1.2)
E-learning platform used	
<i>Surgical Foundations in Basic Science</i> online course (n=39, MCS)	31 (79.5)
<i>School for Surgeons</i> online discussion posts (n=169)	126 (74.6)
<i>Decker Curriculum</i> (n=51, FCS general surgery)	34 (66.7)
<i>BeST</i> (n=169)	32 (18.9)
<i>Surgery in Africa</i> journal club (n=169)	32 (18.9)
Adequate preparation for examinations	
MCS year 2 candidates (n=18)	
Prepared	9 (50.0)
Not prepared	6 (33.3)
Maybe	3 (16.7)
FCS candidates (n=32)	
Prepared	25 (78.1)
Not prepared	1 (3.1)
Maybe	6 (18.8)
Should COSECSA propose a different examination format this year? (N=247)	
Yes	174 (70.4)
No	38 (15.4)
I do not know	31 (12.6)
Blank	4 (1.6)

BeST, Basic Electronic Surgical Training; FCS, Fellowship of the College of Surgeons (of East, Central and Southern Africa); MCS, Membership of the College of Surgeons (of East, Central and Southern Africa)

Surgical services and learning at COSECSA training centres have been reorganized, as evidenced by the participants’ responses, with reductions in face-to-face training. This includes formulating specific COVID-19 teams and designating operating rooms as “COVID ORs”. During the pandemic, extra caution should be taken when performing emergency operations or cancer surgery, for example.[17] Adesoji et al.[6] recommend that surgical services should

dedicate specific operating rooms for COVID-19 patients, especially where caseloads are high. They further assert the importance of initially postponing elective procedures to preserve PPE, staff, and facility capacity.[6] Telemedicine is among the strategies proposed for interacting with patients at the training centres. Reorganizing surgical services has been necessary to optimize resource utilization during the pandemic.[10],[18] According to our survey, COSECSCA training centres are generally following these recommendations.

Potential exposure to COVID-19 among personnel at COSECSCA training centres was among the reported detrimental effects of the pandemic on personal health. Additionally, we found that caring for COVID-19 patients, female gender, being a trainee, and lack of information and guidelines regarding COVID-19 were associated with a higher likelihood of developing psychological distress. It has been proposed that staff are at higher risk of moral injury and mental health problems when addressing pandemic-related challenges.[9] Therefore, the well-being and safety of staff should be a core consideration of all training programmes, and exposure to COVID-19 should be minimized, with psychological support offered where necessary.[6],[8],[19]-[21] An important consideration across the COSECSCA region will be the support of trainees and personnel who are exposed to COVID-19, since mental and emotional well-being has been identified as a key pillar of support during this pandemic.[6],[13]

Surgical training has been adversely affected by the pandemic, resulting in reduced regular operating time, case types, and case numbers.[19],[22],[23] Our study highlighted the negative effects of the pandemic on surgical training and found that trainees believed they were less likely to meet some of the requirements of the training programme, including completion of surgical case logs. Regarding minimum case volume requirements for trainee surgeons, there may need to be different expectations due to the pandemic.[24] In our study, faculty were more likely than trainees to report the possible need for lengthening the duration of training. Likewise, Bernardi et al.[25] observed that the pandemic significantly reduced the practical experience of Italian residents by reducing hands-on experience and affecting case logs. As a result, a restructuring of clinical care and surgical training provision has been advocated for.[17],[26] This may be through the restructuring of work-rest hours or even planned rotations.[27] For instance, Koso and Siow[28] report that orthopaedic resident education in the United States has shifted to online platforms.

There are several online platforms available at the COSECSCA training centres. Trainees reported using the online platforms more during the pandemic. They utilized platforms most relevant to their level of study, with the greatest use among junior trainees utilizing the *Surgical Foundations in Basic Science* modules. Having online platforms available to trainees during the pandemic has allowed for uninterrupted surgical education within COSECSCA training sites. The application of modern technology is critical for surgical training.[29] Indeed, innovations like virtual clerkships can

be utilized to reduce in-person learning time during the pandemic.[30] Remote learning is also beneficial for improving access to a wide array of resources, learning activities, and opportunities.[8] Virtual tools also have the capacity to stimulate positive emotional and motivational responses among trainees, leading to personal growth.[31] Virtual learning has been poised to increase the size of learning audiences and to facilitate educational collaborations between institutions and nations.[20] There is also room to explore virtual training options involving simulation. This is likely to be enhanced by the increasing access to smart technologies and the development of low-cost simulation models.[32],[33] A number of free, open-access online options with assessment modules have also been described.[23] However, internet access has been identified as a major obstacle owing to poor connectivity, high costs, and erratic power supply in sub-Saharan Africa.[34],[35]

The American Board of Surgery responded to the pandemic by cancelling speciality examinations for the year 2020.[36] These drastic actions likely suggest that the current pandemic calls for an appraisal of the existing delivery channels of teaching and assessment.[27] Despite the disruptions to learning caused by the pandemic, our study found that COSECSCA candidates for the 2020 COSECSCA examinations were ready for their examinations, though a majority suggested the use of a different examination format instead of the existing paper-based and in-person examinations. It is imperative, however, that the responses to the disruptions caused by the pandemic will uphold the thorough criteria used to assess the competencies of surgical trainees.[21] Further, COSECSCA and other training bodies should devise alternative examination formats to capitalize on the gains from established enhanced virtual learning.

Study participants reported that outcomes for diseases other than COVID-19 were likely to be poor. As the pandemic continues to evolve, further research in this area could help inform responses aimed at combating chronic and non-communicable illnesses.

Limitations

First, we did not have a way to capture the particulars of those who did not participate or those who dropped out of the study. This could have been useful for generalizing our findings to the study population and beyond. Second, we were limited in the quantification of the mental health effects of the pandemic. Although we uncovered a high rate of self-reported symptoms, which may suggest high rates of anxiety disorders, depression, and sleep disorders during this period, we recommend further research using standardized tools to adequately assess and document the COVID-19 pandemic's impact on mental health and well-being among COSECSCA trainees and faculty.

Conclusions

COSECSCA training centres have instituted multiple measures to combat the COVID-19 pandemic. Despite this, the pandemic has had adverse effects on health and outcomes

among staff and patients. Training centres should endeavour to increase access to information about COVID-19 and enhance infection prevention practices. Likewise, COSECSA should continue to enrich online educational platforms and consider alternative examination formats.

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