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Utilizing technology for global surgery: a survey of the West African College of Surgeons

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ABSTRACT

Background: Information and communication technology (ICT) has been heralded as a possible mechanism for expanding global surgery collaborations. However, little is known regarding feasibility of ICT use in low- and middle-income countries (LMIC). We sought to determine the appropriate ICT platforms for surgical education initiatives and international collaborations.
Materials and methods: We conducted a survey of members of the West African College of Surgeons. Topics included computer and internet access/utilization, familiarity with ICT, such as social media (SM), virtual document sharing platforms (VDS), virtual meeting applications (VM), and learning management systems (LM), and interest in ICT adoption. Statistical analyses were done using chi-squared tests, with Bonferroni corrections.
Results: Survey respondents included 83 individuals from 10 countries, 50% of whom had been in practice >10 y. All had computer access, with most (95%) using SM compared to all other modalities ($P < 0.001$); 77% used SM for professional reasons and 57% for education. Sixty percent of participants used VDS, 73% of whom used it for education. The utilization of other ICTs was lower (VM 43%, LM 32%). Unreliable Wi-Fi hindered every ICT, less often SM (41%) and VDS (23%), and more commonly VM (64%) and LM (52%). Despite this, VM was most often used in international collaboration (79%, $P < 0.01$). Most respondents (98%) supported ICT use for international collaboration.
Conclusions: ICT platforms can support education initiatives and international collaborations in resource-limited areas. Deployment of similar surveys and ICT workshops across other LMIC regions could maximize ICT utilization, further expanding global surgical collaborations.

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Introduction

As highlighted by the Lancet Commission, international collaborations may support the establishment of research and education initiatives focused on improving surgical care in low- and middle-income countries (LMIC).[1] Information and communication technology (ICT) has been proposed as a mechanism for fostering such partnerships. Specifically, given the success of e-learning for facilitation of surgical education in high-income countries (HIC), distance learning in LMIC may be further expanded through ICT use.[2,3] Even so, many cite poor internet connectivity, difficulties downloading material, limited access to computers, and frequent power failures as primary barriers to using ICT in these regions.[3,4] While true, as ICT platforms vary significantly in their bandwith requirements and utilization in different LMIC regions, successful use of locally relevant ICT platforms is often still possible.

Previous data have demonstrated that HIC participants have a strong interest in using ICT platforms to facilitate global surgical collaborations.[5] However, ultimate success of international partnerships depends on both HIC and LMIC collaborators having familiarity with the chosen platform. While studies show that LMIC students, residents, and faculty support expansion of e-learning and ICT utilization, little is known about the current access to and familiarity with ICT among surgeons in LMIC.[6] We sought to determine which ICT platforms may be best suited for use in education initiatives and international partnerships, and hypothesized that LMIC surgeons shared a similar interest in using ICT to facilitate these efforts.

Materials and methods

We conducted a cross-sectional survey of members of the West African College of Surgeons (WACS), which includes 17 West African countries: Benin Republic, Burkina Faso, Cameroon, Ivory Coast, Democratic Republic of the Congo, Gabon, Gambia, Ghana, Guinea, Guinee Bissau, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone, and Togo. Questions focused on computer and internet access/utilization and familiarity with different types of ICT, such as social media ([SM], e.g., Facebook or LinkedIn), virtual document sharing programs ([VDS], e.g., Google Drive and Dropbox), virtual meeting applications, ([VM], e.g., Skype and Facetime), and learning management systems ([LM], e.g., Blackboard and Moodle). Other topics included interest in ICT adoption and the potential for expanded utilization in both regional educational initiatives and international collaborations. A literature search of previous studies examining participant familiarity with different ICT formats in LMIC was used to inform the survey question design.[3,6-11] Survey question language and length, branching logic, and internal validity was then examined through a survey pilot that was distributed to six international partners from West Africa.

Once finalized, we distributed English and French (the primary languages of the region and most of the medical community) versions of the survey electronically through the WACS email list. Paper versions were also distributed at the 57th Annual WACS Conference and the 11th Biennial meeting of the Pan African Pediatric Surgical Association in Lagos, Nigeria.

Survey responses were collected and managed using REDCap electronic data capture tools hosted by the Oregon Clinical and Translational Research Institute.[12] Study approval was obtained from the Oregon Health & Science University Institutional Review Board (IRB0012015). A wavier of documentation of consent was obtained from our Institutional Review Board, and participants were provided with an information sheet about the study. In addition, on the first page of the survey, participants were asked to select "yes" or "no" to the following statement: "I have read the above information and understand that in proceeding with this survey, I consent to participate."

Statistical analyses were completed on STATA 14. Descriptive analyses using question-specific frequencies and cross-tabulations were used to examine question responses. Comparisons between ICT platform familiarity and interest were assessed using chi square tests, with Bonferroni pairwise comparisons as appropriate. Statistical significance was set at $P \leq 0.05$.

Results

Demographics

A total of 83 individuals began the survey, and 71% completed all sections. Most respondents were males (80%) and most (81%) had ages ranging from 35-54 years-old (Table 1). While almost all were attendings/faculty (80%), only 50% had been in practice for greater than 10 y. Most respondents came from

Table 1 – Demographics (n = 63).

Patient characteristics	N	%
Age	63	
<25	2	3%
25-34	1	2%
35-44	24	38%
45-54	27	43%
55+	9	14%
% Male	50	79%
Position	59	
Student	1	2%
House officer (intern or resident)	6	10%
Fellow/Advanced trainee	5	8%
Faculty/Consultant	47	80%
Years in practice	60	
Still in training	2	3%
<1 y	5	8%
1-4 y	13	22%
5-9 y	10	17%
10-20 y	7	12%
>20 y	23	38%