Evaluating the impact of a virtual international global surgery conference as a means for global surgery and health education

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ABSTRACT

Objective: Global Surgery was established as a specialty in the 1980s to improve worldwide surgical care and delivery; however, despite having significant importance, a lack of exposure remains within undergraduate and postgraduate training schemes. This study aims to evaluate the impact of a free international virtual Global Surgery conference in raising interest, awareness and knowledge for medical and allied healthcare professional students, surgical trainees and surgeons worldwide.

Design: A free one-day international Global Surgery conference was organised in May 2021 and broadcast on a worldwide delegate online platform; there were seven keynote presentations. Registered delegates completed pre- and post-conference questionnaires. Data were collected including country of origin, training/professional level, Likert (1–5) scale ratings of conference keynote topics and VAS (0–10) scores for overall conference evaluation. Furthermore, qualitative feedback in relation to positive feedback and ideas for improvement was also invited, and in cases where multiple feedback was given, was categorised separately.

Setting: The study was undertaken by the St Andrew’s Anglia Ruskin (StAAR) Research Group, School of Medicine, Anglia Ruskin University, Chelmsford, UK.

Participants: There were 230 registered delegates; the attendance rate was 81.7% (188/230), representing a variety of different training/professional levels from 50 countries. For attendees, the questionnaire response rate was 88.8% (167/188).

Results: There was a significant increase in knowledge improvement regarding six conference topics, with five achieving a median (IQR) post-conference Likert score of 5(1) and one achieving a score of 4(1) (p < 0.001). Average confidence and knowledge remained unchanged on the use of social media to access worldwide surgical education (p = 0.667). Overall, the conference received high satisfaction (9.4/10) and recommendation (9.5/10) ratings.

Conclusion: Our findings support the concept of free Global Surgery virtual conference integration into medical and allied healthcare professional student curricula worldwide, to promote early awareness and facilitate the growth of the healthcare ‘workforce of tomorrow’.

1. Introduction

Global Health, established in the 1940s by the World Health Organisation (WHO), is a movement that contributes to research, education, medical and public health practice; it may be defined as ‘an area for study, research, and practice that places a priority on improving health and achieving equity in health for all people worldwide’ [1, 2, 3, 4]. The main fields explored by Global Health are infectious diseases, malnutrition, paediatric care and maternal support. These are considered by the WHO to be health emergencies worldwide, alongside immunisation problems, substance abuse, water and sanitation and environmental health [5, 6].

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Despite the evidence in the literature suggesting that up to 30% of worldwide disease burden is surgical, contributing to up to 60% of hospital admissions and referrals in some countries e.g. Mozambique, access to surgery is rarely mentioned as a Global Health emergency [1, 7, 8]. Thanks to individuals, researchers, professionals and advocacy groups, Global Surgery was established as a specialty in the 1980s to address such matters. The aims of Global Surgery can be defined by this quote: ‘providing improved and equitable surgical care to the world’s population, with its core tenets as the issues of need, access and quality’ [9]. A holistic approach is advocated, recognising the importance of multidisciplinary teams and perioperative care, as well as adequate provision of surgical services worldwide [10, 11].

It is often thought that access to safe surgical care is a unique problem in lower and middle-income countries (LMICs); it is indeed true that nine out of ten people living in LMICs lack safe surgical and anaesthetic care when required [1]. However, while high-income countries may have more surgical resources, reporting up to 10 times more operating theatres and up to 100 times as many surgeons in some cases, one must also recognise that patients who are of ethnic minorities, indigenous, poor or that live in remote areas in high-income countries, may also substantially suffer from inadequate surgical care; these factors are amongst many that contribute to Global Surgery being a subject of interest worldwide [7, 10, 12, 13].

Although there has been an increase in Global Surgery awareness, research has highlighted a lack of exposure to this specialty. A survey of student representatives from 90% of UK medical schools showed that only 10% of student responders had previously been exposed to this topic, with 2.5% aware of the potential career possibilities [14]. Another survey at McGill University in Canada reported that 55% of students were unsatisfied with Global Health and Surgery teaching and a US-based study confirmed low exposure to Global Surgery in medical school as well [15, 16]. In order to target these global issues, the implementation of Global Surgery conferences and symposia has shown to be a successful way of exposing students and increasing their confidence in Global Surgery as a career. However, there is a lack of evidence of the impact of these conferences on students’ interests and beliefs, particularly when streamed online at a global level [17]. Therefore, the primary aim of this study is to evaluate the impact of a free international virtual Global Surgery Conference in raising interest and awareness for medical students, trainees and surgeons worldwide.

2. Materials and methods

A one-day international Global Surgery Conference was organised in May 2021 by two university societies based in the United Kingdom and broadcast on a worldwide delegate online platform. The conference consisted of seven keynote talks, interactive and question-answer (Q&A) sessions (Table 1). In order to further encourage participation, smaller discussion forums were created, and participants were invited to ask questions by using a (hands up) function to indicate their questions and unmute themselves. Furthermore, questions were addressed by the host of the forum when typed into the chat box function. Global Surgery expert speakers were invited from nine countries: Australia, Malaysia, United Kingdom, United States, Sierra Leone, Poland, South Korea, South Africa and Colombia.

Conference details and invitations were disseminated via social media, international student interest groups, university and hospital platforms, hence reaching a wide range of students and healthcare professionals worldwide; an online link was provided to facilitate registration. All registered individuals were emailed a pre-conference survey prior to the event date and a post-conference survey was emailed to all attendees; informed consent was obtained prior to inclusion. Data were anonymised by assigning a unique identifier code and collected in relation to demographics (Figure 1), Global Surgery experience, specific conference topics (Table 1), educational change and keynote speaker feedback. Likert scales (1–5) and visual analogue scores (1–10) were used for the delegates’ conference topic opinions and overall feedback; accordingly, qualitative feedback in relation to positive feedback and ideas for improvement was also invited, and in cases where multiple feedback was given, was categorised separately (Table 2). Themes were agreed prior to analysis by all authors; thematic analysis was undertaken by 2 authors (ACC/IC), in cases where there was disparity between thematic categories, this was decided by the senior author (BHM).

A Likert scale (score of 1 = Completely disagree, 2 = Somewhat disagree, 3 = Neither agree nor disagree, 4 = Somewhat agree, 5 = Completely agree) was used to assess perceived knowledge and confidence in the conference subjects before and after the conference. Data were analysed using the statistical software SPSS V.27 (IBM Corp, Armonk, New York) and initially assessed for normal distribution; as all data were non-parametric, median and interquartile range (IQR) values were calculated, with p-values generated using the Wilcoxon signed rank test.

3. Results

There were 230 conference registrations from 50 countries spread throughout the following world regions: Asia = 35.7% (82/230), Europe = 31.7% (73/230), Africa = 13.5% (31/230), South America = 17.4% (40/230), North America = 0.9% (2/230), Oceania = 0.9% (2/230) (Figure 1). The distribution of registrations by training/professional level is presented (Figure 2); the attendance rate was 81.7% (188/230).

3.1. Pre-conference survey

The pre-conference survey response rate was 100% (230/230). Collected data indicated that 82.0% (189/230) of registered delegates were interested in pursuing a surgical career. Regarding previous Global Surgery education, 67.8% (156/230) declared that they had received zero/one lecture, and 32.2% (74/230) received two or more lectures over their entire career to date. Furthermore, 87.4% (201/230) of registered delegates agreed that they would benefit from more Global Surgery lectures. The median pre-conference delegate Likert rating

| Conference Topic/Overall Subject Matter Knowledge Assessment | Pre-Conference Rating Median (IQR) | Post-Conference Rating Median (IQR) | P-Value |
|-------------------------------------------------------------|-------------------------------------|-------------------------------------|---------|
| Knowledge of Unethical/Unhelpful Surgical Missions Abroad   | 3 (2)                               | 5 (1)                               | <0.001  |
| Awareness of Global Surgery Indicator Data Collection Processes | 3 (3)                               | 4 (1)                               | <0.001  |
| Knowledge of Use of Social Media, Podcasts & Internet to Access Surgical Education | 5 (1)                               | 5 (1)                               | 0.667   |
| Knowledge of Tasks & Aims of Gender Equality Initiatives in Global Surgery | 3 (2)                               | 5 (1)                               | <0.001  |
| Knowledge of the Role that Investment in Surgical Care Plays when Preparing for a Pandemic | 3 (2)                               | 5 (1)                               | <0.001  |
| Knowledge of Ethical Issues that Impact the Future of Global Surgery Initiatives | 3 (2)                               | 5 (1)                               | <0.001  |
| Knowledge of the Surgical Research that Influences Global Surgery & How to Get Involved | 4 (2)                               | 5 (1)                               | <0.001  |
regarding awareness of the different subject matters addressed by Global Surgery was 3 (IQR = 2). Furthermore, only 18.7% (43/230) of participants declared that they were aware of different Global Surgery platforms and research groups e.g., university interest groups, international and national organisations. In addition, 77.0% (177/230) of registered delegates declared that they had not yet been actively involved in Global Surgery initiatives.

When asked to provide written feedback about previous experience and general thoughts on the field of Global Surgery, registered delegates expressed interest in learning more about ‘the available learning, internship and research’, ‘pandemic and disaster preparation in the surgical field’, ‘the future of robotics in Global Surgery’, and many indicated that the speciality was essential to ‘promote global access to people in need’.

3.2. Post-conference analysis

The post-conference questionnaire response rate was 88.8% (167/188). 64.1% (107/167) were medical students, whereas 18.6% (31/167) were doctors and 17.3% (29/167) were other professionals. Overall, there was a high mean conference satisfaction score (9.4/10), a high mean likelihood that attendees would recommend this conference to others in terms of content (9.5/10) and the conference was highly regarded in terms of being delivered in a professional manner (9.4/10). The speakers’ choice of content and variety mean score was also high (9.3/10), as was the widely appreciated international nature of the panel (9.1/10). Examples of written feedback in relation to the conference highlights are presented (Table 2). Following the conference, attendees reported a significant improvement in understanding across all main topics, although the knowledge in relation to the use of social media, podcasts and the internet in order to access surgical education remained high and unchanged (Table 1).

4. Discussion

Global Surgery is a rapidly expanding field of particular importance in low and middle-income countries (LMICs) [1, 13]. Despite the fact that
various initiatives and charities have embraced the concept of sustainable interventions in LMICs, there is still a great need for public awareness and support on such issues; this is particularly relevant within the framework of Global Surgery [15]. To address this, some studies have looked at the efficacy of Global Surgery events, for students and healthcare professionals, however, none have achieved this on a truly international scale and within the context of a free virtual conference [15, 17].

In a USA-based study of 116 conference attendees, 70 completed a post-conference survey and 58 were matched to pre-conference survey results; greater confidence in understanding Global Surgery as a career was demonstrated after the conference (p < 0.00001) [17]. Our larger study of 230 registered delegates has further reinforced the effectiveness of these conferences; however, it has demonstrated this across international attendees of all levels and within a range of important Global Surgery subjects (Figure 1, Table 1). Furthermore, even though the USA-based study gathered similar results regarding the lack of registered delegates’ exposure to Global Surgery (43%), it concluded that participants’ beliefs on the importance of the different Global Surgery components did not change after the conference [17]. However, a unique approach employed in our study was that we specifically analysed the changes in attendees’ knowledge regarding specific topics presented at the conference itself; an overall improvement was demonstrated (Table 1).

Pre-conference data demonstrated a knowledge deficit in relation to the subject matters addressed by Global Surgery, with 67.8% (156/230) of registered delegates declaring that they had received zero/one lecture over their entire career to date. Furthermore, the fact that 87.4% (201/230) of registered delegates reported that they would benefit from more Global Surgery lectures, supports the concept of further integrating the speciality into medical curricula worldwide and actively providing more participation opportunities; as with similar reports from other areas of medicine, Global Surgery conferences and programs could provide these opportunities [13, 15, 16, 18].

Post-conference data indicated there was a significant improvement in the knowledge of attendees regarding six main conference topics, with five topics achieving a median (IQR) post-conference score of 5(1) and one achieving a score of 4(1) (p < 0.001) (Table 1). However, there was no change in the median (IQR) post-conference score regarding ‘Knowledge of Use of Social Media, Podcasts & Internet to Access Surgical Education’ 5(1) vs. 5(1), (p = 0.667) (Table 1). This likely reflects that conference attendees were already adept at using social media and online resources within the context of medical education, research and collaboration, however, they greatly benefited directly from the content of the Global Surgery conference [9, 18, 19].

It is well known that, while free online conferences generate greater numbers of registrations compared to face-to-face conferences, the proportion of attendees of online conferences can be significantly lower [19]. Previously published research has indeed shown that a careful balance must be found between charging registrants with participation fees, as this would significantly hinder attendees from LMIC and lower social classes and achieving good attendance rates [19]. The conference attendance rate reported in our paper is high (82%, 188/230), with a greater number of attendees in comparison to a conference based in Boston (116 attendees); furthermore, our post-conference survey response rate was also higher (88.8% (167/188) vs. 60.3% (70/116)) [17]. We believe this to be in part due to the online, free and international nature of our conference, which also facilitated easy registration and attendance from anywhere in the world [16]. In addition, the virtual nature of our conference resulted in an ability to reach attendees of all career levels and across 50 nationalities; this variety of reach demonstrates that the interest in Global Surgery is universal and not limited by background (Figure 1).

High post-conference satisfaction (9.4/10) and recommendation (9.5/10) scores were also reported by attendees. These scores reflect the fact that conference content was both well put together and delivered, in terms of providing relevant exposure and interest, as verified by attendee feedback (Table 2). For example, 50.8% (98/193) of positive feedback specifically commented on the conference theme, novelty and variety of content, 20.7% (40/193) commented on the diversity and quality of speakers and 17.1% (33/193) of feedback rated everything as excellent/good. We believe that this feedback further reflects our efforts to include speakers from a variety of continents, invite participants from a variety of countries and include a variety of topics. Furthermore, 59.3% (99/167)
of feedback suggested that no improvements were required. However, 16.2% (27/167) of feedback suggested altering the conference to a 2-day event; this would also allow for the incorporation of other useful suggestions such as increasing speaker interaction time (9.6%, 16/167) and the number of small group workshops accessible to attendees (6.6%, 11/167) (Table 2). It is worth noting that the distribution of undergraduate medical students and postgraduate trainees and surgeons was 64.1% (107/167) vs. 18.6% (31/167).

The aforementioned positive conference feedback was achieved using a variety of methods including interactive PowerPoint presentations, questionnaires, surveys and Q&A sessions. We have also found that employing such techniques offers the opportunity for attendees to engage more effectively with the event, opening more doors by freely broadcasting accessible online educational resources worldwide [20, 21, 22].

Certain limitations were noted with the study. For example, a proportion of registered candidates did not attend the conference; this may have been due to the conference being free and therefore attracting immediate registration that was subsequently not possible for candidates to adhere to. Unfortunately, we were unable to collect the reasons for non-attendance under these circumstances. Although we believe our data still reflect an improvement in knowledge, data were primarily collected in a subjective, rather than objective fashion; in the future, a pre-conference and post-conference assessment could be administered to participants to address this. We also recognise that there may have been an element of selection bias towards candidates who had internet access; however, in relation to other conferences held worldwide on a face-to-face basis, we believe that online access is easier for attendees who would otherwise be in a mandatory position to travel internationally. Finally, in the future, it would be beneficial to be able to offer multiple language choices in conference delivery to the Global Surgery community.

5. Conclusion

We have reported the largest study in relation to a truly international Global Surgery conference, attended by 188 students and healthcare professionals from 50 countries. Our findings indicate that confidence and perceived knowledge significantly increased across the Global Surgery conference topics after the event, which also received high satisfaction (9.4/10) and recommendation (9.5/10) ratings. This was achieved by using a variety of methodologies to deliver content in a free and accessible manner. While we recognise that undergraduate vs. postgraduate attendees were split 64.1% (107/167) vs. 18.6% (31/167), our findings suggest that using these methods will increase awareness and understanding of Global Surgery as a unique speciality, while also providing an opportunity for relevant international networking during Q&A and discussion sessions during those events. We support the concept that free virtual conferences are integrated into the medical and allied healthcare professional student curricula worldwide, including promoting Global Surgery awareness at an early stage and facilitating the growth of the healthcare ‘workforce of tomorrow’.

Declarations

Author contribution statement

Anna Chiara Corriero; Inês F Silva Correia: Conceived and designed the study; Performed the study; Analyzed and interpreted the data; Contributed reagents, materials, analysis tools or data; Wrote the paper.
Kee B Park; John Kinneir: Contributed reagents, materials, analysis tools or data; Wrote the paper.
Benjamin H Miranda: Conceived and designed the study; Analyzed and interpreted the data.

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Data availability statement

Data will be made available on request.

Declaration of interest’s statement

The authors declare no conflict of interest.

Additional information

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