Original Article

The use of Virtual Media in Postgraduate Medical Training during the COVID-19 Pandemic: Experience from a Resource-Constrained Setting

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Abstract

Context: The novel coronavirus disease 2019 (COVID-19) pandemic brought about public health safety measures of social distancing and avoidance of crowded gatherings. These led to widespread disruptions in activities of daily living, as well as routine health-care services and learning activities. There has been a noticeable move to the online domain as the platform for teaching and learning. **Aims:** The present study aimed to describe the online learning and teaching experiences of postgraduate medical doctors in Nigerian hospitals. **Subjects and Methods:** The study was a cross-sectional online survey sent to medical doctors across social media platforms, and it sought to find out the current number of hours utilized and modalities of their online educational media use. **Results:** A total of 116 doctors responded and completed the survey, with 74 (63.8%) and 104 (89.6%) of them having some webinar experience before and during the pandemic, respectively. At least 82 (70.4%) had 1–5 h of online learning activities each week, and an overwhelming 114 (98.2%) used a personal Internet data subscription to access online educational material. In addition, 56 (48.3%) felt that online learning was less rewarding than in-person interactions even though 93 (80.2%) found the online learning activities to be quite convenient. Poor Internet connectivity was cited as a major challenge to a successful online learning experience in 80 (68.9%). **Conclusion:** Although the COVID-19 pandemic restricted face-to-face human contact including learning activities, postgraduate medical education has filled the void by increasing online learning activities, resulting in an admixture of experiences and reactions.

Keywords: COVID-19, online learning, postgraduate medical education, virtual medium

Introduction

On March 11, 2020, the World Health Organization (WHO) declared the novel coronavirus disease 2019 (COVID-19) as a pandemic due to the alarming rise in new cases across the globe.[1] Transmission of the infection required close contact with infected persons, even though asymptomatic carriers could also transmit the disease. As such, in order to slow down the rate of new infections and prevent the spread of the disease, the WHO recommended public health safety guidelines including isolation of persons with respiratory symptoms and maintaining social distancing and avoidance of crowds.[1-3] Many countries, including Nigeria, implemented these guidelines as well as other measures to curtail the spread of infection, as exemplified by closure of all nonessential public services and prohibition of nonessential travels.[4,5]

In tandem with disruptions in all activities of daily livelihood, these COVID-19 restrictions impacted negatively on health-care services. There has been significant disruption to routine clinical services, as well as teaching and training activities.[6-8] In-person and inhospital postgraduate medical training activities were suspended in many institutions.[9-11]

In order to curtail the effects of these disruptions to postgraduate teaching and training, there has been a noticeable move to the online domain as the platform for teaching and learning. More than 50% respondents from a recent survey were using online

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learning platforms for the first time; they had never used it before COVID-19.[12] This has seen clinical rotations replaced with simulations, virtual learning, and webinars.[6,8,13] Journal clubs, presentations and conferences, as well as summative examinations have also moved online.[7,10,13]

There have been mixed reactions to the use of virtual media and online platforms in postgraduate medical education.[7,11,14,15] The concerns for a lack of person-to-person interaction and the perceived inability to deliver complex concepts through online medium were some of the reasons accounting for a lack of satisfaction of the online medium in one survey, whereas Wi-Fi availability was linked with significant satisfaction in another.[12,14] An overwhelming majority would like to continue the online experience after the COVID-19 period.[14]

The present study aimed to describe the online learning and teaching experiences of postgraduate medical doctors in Nigerian hospitals.

Subjects and Methods

The study was a cross-sectional online survey sent to medical doctors across social media platforms. The survey was conducted between June 29, 2020, and July 14, 2020. Participants who consented to the survey answered questions that sought to find out their previous use of online educational media, as well as the current number of hours utilized and modalities of their online educational media use. The responses were recorded as numbers, open-ended statements, or a Likert scale. Respondents were kept anonymous, and the survey was conducted according to the provisions of the Helsinki Declaration.

Data were collected using Google Forms, and the results were summarized in Excel sheets. The survey findings were presented as prose, figures, and tables. Discrete variables were summarized as percentages, whereas continuous variables were summarized as means.

Results

Description of participants

A total of 116 doctors responded and completed the survey. The distribution of their places of practice, job titles, and area of specialization are shown in Table 1.

As shown in Table 1, the participants cut across different tiers of hospitals and job cadres. The tertiary hospitals were represented by teaching hospitals, 91 (78.4%), and federal medical centers, 10 (8.6%). The medical disciplines comprised internal medicine, psychiatry, community medicine, and family medicine. The pathology disciplines included medical microbiology, hematology, chemical pathology, and histopathology. The surgical disciplines were made up of anesthesia, general surgery, ophthalmology, radiology, radio-oncology, otorhinolaryngology, and orthopedics. Obstetrics-gynecology and pediatrics accounted for the remainder of the participants, with the least and highest proportions, respectively.

Table 1: Distribution of survey participants according to place of work, job titles, and specialty

Category	Number of respondents, *n* (%)
Place of work/training	
General hospitals	5 (4.3)
Private hospitals	10 (8.6)
Tertiary hospitals	101 (87.1)
Job titles	
Consultants	50 (43.1)
Interns/medical officers	15 (12.9)
Resident doctors	51 (44.0)
Areas of training/specialties	
Medical disciplines	24 (20.7)
Obstetrics/gynecology	6 (5.2)
Pediatrics	54 (46.6)
Pathology disciplines	14 (12.1)
Surgical disciplines	18 (15.5)

Online educational experience

The participants were asked if they had engaged in an educational webinar or online academic activity before the COVID-19 pandemic, as well as the number of times and duration they had engaged in online academic activity during the COVID-19 period. A total of 74 (63.8%) and 104 (89.6%) of the 116 participants had some webinar experience before and during the COVID-19 pandemic, respectively. Table 2 further summarizes the webinar experiences of the participants during the COVID-19 period.

Internet access for online educational activity

An overwhelming 114 (98.2%) of the study respondents used a personal Internet data subscription to access online educational material, whereas only one (0.9%) used an institutional Wi-Fi connection. Another one (0.9%) utilized both personal data subscription and institutional Wi-Fi to access the Internet for their educational activities.

The participants were asked to estimate the monetary cost of the data subscription per week that was thought to account for the online educational use. The prevailing exchange rate was 1USD = N385. A total of 11 (9.7%) spent <N500 each week, whereas 27 (23%) spent N500–999; others were 41 (35.4%) N1000–1499, 17 (15%) N1500–1999, and 19 (16.8%) N2000 or more.

Perceptions of participants on the online learning environment

The survey sought to find out how the participants viewed the online learning environment. The participants were required to choose from a group of words, which one(s) described their perspectives and feelings regarding online learning. Their responses are illustrated in Figure 1.

As depicted in Figure 1, majority of the participants viewed online learning to be quite convenient, even though four (3.5%) asserted it to be expensive.

The participants were also asked to choose from a list of words, the emotions that best describe their feelings during online learning activities. Their responses included: 55 (47.1%) felt calm, 45 (38.8%) were relaxed, 23 (19.8%) felt happy, 38 (32.8%) were composed, 5 (4.3%) fatigued, 8 (6.9%) were nervous/apprehensive, and 10 (8.6%) felt tense/pressured. However, 24 (20.7%) did not share any feelings as they had not made a presentation themselves.

Perceived challenges to online learning activities

An open-ended question was asked concerning the challenges to a successful online learning experience for the participants. A total of 80 (68.9%) of the participants cited poor Internet connectivity as a major challenge in their online learning experience. In addition to this, there were a variety of responses to the question, as depicted in the box in Figure 2.

The participants reported having their online sessions interrupted by people within their vicinity who are unaware or not interested in the ongoing online activity, hence it was difficult to get a convenient space for the activity. Others reported having competing interests when the online activity coincided with clinical duties. At times, online platforms have a restricted number of members, and the survey participants reported being denied access when the meetings reached maximum allowed capacity. In addition, some webinars end abruptly due to technical hitches, or a participant gets ejected from the platform by the host.

Table 2: Participation in online academic activities during coronavirus disease 2019 by the study respondents

Category	Number of respondents, *n* (%)
Number of online educational programs per week in department/unit	
0	28 (24.3)
1-5	82 (70.5)
>5	6 (5.2)
Number of online educational programs per week from organizations outside the department	
0	12 (10.4)
1-5	91 (78.3)
>5	13 (11.3)
Duration in hours of online training per week in department/unit	
0	26 (22.6)
1-5	82 (70.4)
>5	8 (7.0)
Duration in hours of online educational programs per week from organizations outside the department	
0	11 (9.4)
1-5	95 (82.1)
>5	10 (8.5)
Number of online presentations delivered by study participants during COVID-19	
0	49 (42.5)
1-5	58 (49.5)
>5	9 (8.0)

COVID-19: Coronavirus disease 2019

Comparing online learning activities with in-person or face-to-face activities

Another question posed to the survey participants was how the online learning compared with face-to-face learning activities. A large portion of respondents, 56 (48.3%), said that online learning was less rewarding than in-person interactions. Another 39 (33.6%) said that it compared the same with in-person learning, whereas 13 (11.2%) felt that it was more rewarding than in-person learning. A few respondents, however, eight (6.9%) were not sure how their learning experiences compared.

Furthermore, 77 (66.4%) agreed to recommend more online learning activities in their respective institutions, whereas 13 (11.2%) did not agree to recommend increasing the number of online activities in their institutions. The remaining 26 (22.4%) were undecided on the issue.

Discussion

The study describes the online learning experiences and perceptions of some postgraduate medical doctors in Nigeria during the COVID-19 pandemic. Majority of the respondents worked at tertiary hospitals and were either consultants or resident doctors. This is not surprising as

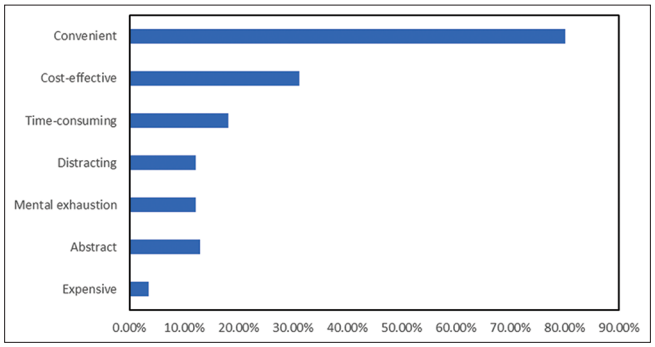

Figure 1: Perceptions of participants regarding the online learning environment

Question: What in your opinion were your challenges to successful online meetings?

Responses
- Problem of having a convenient office or home space for the meeting
- Competing priorities
- Some of the presentations take too much time often more than an hour
- Not sure if the audience is following due to lack of eye contact
- Distraction from other side happenings at home or office
- Access restrictions to meeting
- Unexpected exiting from meeting
- Cost and timing
- Background noise from participants with unmuted devices
- Lack of prior training on online meetings

Figure 2: Responses of survey participants on their challenges to a successful online activity

postgraduate teaching in Nigeria predominantly takes place in tertiary centers and involves the aforementioned groups of doctors. There was, however, a disproportionate distribution of the subspecialties represented by the participants, with a preponderance of pediatricians and medical disciplines, as compared to the surgical or laboratory-related disciplines. This disparity probably reflects on the limitations of the distribution of the survey through social media platforms, rather than the practice of online learning by these subspecialties. However, it is tempting, to make assumptions that perhaps there are peculiarities that make online learning not suitable to these specialities in the study area; even though literature abound across the globe, on the successful use of online learning in the dental, orthopedic, plastic surgery and radiology disciplines.[6,7,9-11,13]

Majority of the study participants had experienced online learning before COVID-19, and the proportion became higher during COVID-19. This not only agrees with other studies but also shows a similar proportion of 89% in uptake of online learning during the pandemic.[7] However, the present study showed a higher proportion of pre-COVID-19 online experience, perhaps because it surveyed participants across many subspecialties unlike the study of Alqurshi.[12]

It can further be surmised that majority of the participants spend between 1 and 5 h every week in one form of online learning or the other. In addition, more than half of the participants had conducted at least one online presentation during the COVID-19 pandemic. These numbers show a tremendous amount of online activity being carried out by Nigerian postgraduate medical doctors. No other study at present has attempted to quantify the volume of online learning undertaken during the COVID-19 pandemic, as described here. However, this is not likely to be less than what obtains in other places, if not more.

Interestingly, all but two of the participants used personal Internet data subscriptions to access online learning activities. This is in sharp contrast to Sharma *et al*., where only 14% relied on personal data subscriptions.[14] Perhaps, this is based on the availability of Wi-Fi, rather than a preference of the participants to buy data. As a result, substantial costs were being incurred by the participants on a weekly basis in order to achieve the virtual learning. Unfortunately, the study did not seek the reasons behind the participants' choices for Internet access.

Majority of the survey described the virtual learning medium to be convenient. Some of the reasons for this perception were stated as the ability to log-in from a remote area in real time, the ability to join at different time periods, and the ability to run the online activity at the learner's pace. This compares with Agarwal and Kaushik where all the participants indicated that they enjoyed their online learning experience.[15] Interestingly, a third of the participants felt that online learning was cost-effective even though almost all were using data subscription. Perhaps, this feeling was because the participants had differing amounts of time utilized for the online activity, and this could be the opinion of the low data users. Unsurprisingly, some of the participants felt that online learning was expensive. Perhaps, these were the high-volume data users.

Despite the huge perceived convenience of online learning, there were quite several negative perceptions regarding the online or virtual learning environment. The study of Alqurshi found that 35% of its participants were distracted during online activities on their smartphones.[12] The present study discovered similar complaints but to a smaller extent of 12%. A corresponding proportion also felt that online learning was mentally exhausting or it was abstract, which compares with the findings of Alqurshi where a sizeable portion felt that online learning was not adequate in explaining complex concepts and did not meet their learning needs.[12] These admixtures of feelings underscore the need to have a balance in the number, duration, timing, learning objectives, and content variety of the online activities to enhance participants' learning.

A range of emotions were expressed by the study participants during online learning activities. While a large portion felt composed, calm, relaxed, or happy, a few of them felt pressured, nervous, or apprehensive. The explanations offered for some of these emotions were that some participants felt calm because there were not presenting in front of an audience, whereas those who felt pressured were struggling to use the technology, as it was a new experience to them.

In the participants' own words, poor Internet access was a major challenge to successful online learning. They cited situations where Internet connections cease abruptly and they get exited from webinars, or they do not get to log-on to the meeting in a timely manner. Therefore, unreliability of the Internet connection made continuous participation in the webinars very challenging. Sharma *et al*. had a smaller proportion of participants reporting Internet connectivity issues, perhaps because of the wider use of Wi-Fi which was not available in the present study.[14] As shown in Figure 2, another challenge encountered by the participants was the lack of eye contact with the audience or online viewers, which made presenters uncertain as to whether they were communicating.

Following the numerous challenges encountered, almost half of the participants were not satisfied with their current online learning experiences. This approximates the level of satisfaction documented by other studies, where Internet connectivity was linked to a satisfactory online learning experience.[7,14] However, a larger portion of these participants recommended to have the online learning activities continued even after the COVID-19 period.

Conclusion

Although the COVID-19 pandemic had imposed restrictions on face-to-face human contact including learning activities, postgraduate medical education has filled the void by increasing online learning activities. This has been met with mixed reactions, but overall, the online learning experience appears promising and convenient, albeit being driven by personal Internet data subscription and cost. Improving Internet connectivity and a careful selection of online activity based on the defined learning objectives may improve the level of satisfaction attained with this learning medium. The survey recommends that postgraduate training institutions should invest in online technology and incorporate virtual teaching activities into their curricula, so that this modality of learning will become entrenched in postgraduate medical training, going beyond the pandemic.

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Conflicts of interest

There are no conflicts of interest.

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