COVID-19 impact on International Physician Associate Educational Programs

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Abstract

The purpose of this research is to understand the impact of the COVID-19 pandemic on International Physician Associate (PA) Education as of May 2020.

A modified version of the Physician Assistant Education Association COVID-19 impact survey was used to assess the effects of the pandemic on international PA programs, including budgets, students, faculty, staff, clinical training, didactic training, and program support. Standard descriptive statistics, including chi-square and dependent group (paired) t-tests were utilized.

Twenty-four percent of International PA programs responded to the survey including from Canada, the Netherlands, Switzerland, the United Kingdom and Ghana. The majority of programs reported moving didactic education online and suspending clinical training. Yet, student graduation was anticipated to be on time. Despite this success in a crisis, the survey indicates a negative impact on staff, students and faculty with a greater effect on staff than faculty.

The COVID-19 pandemic impacted global health workforce education. The ability of international PA programs to survive similar unexpected external challenges requires planning for future scenarios. While the results showed that programs were able to move didactic curriculum online, moving clinical curriculum online presented challenges. Consideration of flexible clinical training that minimizes in-person direct interaction needs further development and exploration.

Keywords: physician associate; international education; covid-19

Introduction

The year 2020 evolved into a year no one expected, where all parts of our everyday lives including our educational programme were impacted by a global pandemic. In the first week of December 2019, a patient in the city of Wuhan...
sought medical help for pneumonia-like symptoms and by August 3rd, 2020 the World Health Organization reports globally there are 18,142,718 cases, 691,013 confirmed deaths in 216 countries, areas or territories (World Health Organization, 2020). Pandemics are not new to the world, and global pandemics have occurred periodically throughout history. The modern industrial age, new transport links, the global community and ongoing poverty, facilitate pandemic disease transmission. What makes the 2019-2020 Coronavirus (COVID-19) pandemic different is the unknown modes of transmission, its virulence and the speed of which it spread, making a significant impact on our society (Entangled.solutions, 2020; World Health Organization, 2020).

Policies such as social distancing, shelter-in-place and the use of face coverings were widely adopted to mitigate the spread of the virus internationally. COVID-19 transformed the existing inpatient and outpatient clinical environments as emergency systems meant to prepare for COVID-19 testing and treatment, as well as care of the critically ill, diverted the healthcare workforce from their respective specialties to the emergency and critical care environments. To prepare the global health workforce for their new roles, a rapid scale-up of short courses in critical care medicine and ventilation management evolved. These dramatic shifts occurred in the setting of little knowledge about the virus’s routes of transmission, virulence or pathophysiology (Centers for Disease Control and Prevention, 2020; Nagesh and Chakraborty, 2020). To compound the health delivery issue the World Health Organization in 2015 indicated that 1 billion people globally were without access to health care worldwide and estimated shortage of 4.3 million health-care personnel to care for the world's population (Rick and Ballweg, 2017). Physician Assistants (PA), also known as Physician Associates, and similar health-care professions in over 50 nations are increasingly used as a response to physician shortages.

At the same time, the world’s universities closed their campuses. European, African, and North American medical programs suspended portions of their curricula, in particular traditional classroom-based instruction. After the faculty and students left the classroom environment, lectures, labs and seminar sessions were adapted to online platforms in a matter of days or weeks (Ashokka et al., 2020). Hands-on clinical skills training paused while online case-based simulation and media supplemented the education of students. Shortages in personal protective equipment (PPE), concerns about COVID-19 infections among students, disruptive changes in the workflow of healthcare delivery, and cancellations of elective medical visits and surgeries prevented PA students from participating in their clinical education. Assessments of students moved to a didactic online examination format with or without proctoring, and clinical courses modified objective structured clinical examinations (OSCEs) to assess clinical interviewing and physical exam skills. The educational pivot demanded swift action, albeit chaotic. Faculty and staff reacted quickly despite the uncertainty of their roles and questionable stability of their positions (Centers for Disease Control and Prevention, 2020; Nagesh and Chakraborty, 2020).

As the world turned upside-down the change to the PA Education model was dramatic. PA education generally follows a year of didactic academic focus in biomedical sciences, patient assessment, population health and medical foundations. This academic year is followed by a year of clinical rotations consisting of in-person, hands-on training in medical and surgical specialties with the goal of preparing a medical generalist at graduation.

In his book, Our World Turned Upside Down: Radical Ideas during the English Revolution, Christopher Hill discusses that societies often need to change quickly due to unpredicted events. This paper describes how some International Physician Associate education programs managed to find solutions to the problems of our times, during the times when what we did changed dramatically, and when our educational worlds turned upside down (Hill, 1972).

**Methods**

A modified version of the Physician Assistant Education Association (PAEA) COVID-19 impact survey was used to assess the pandemic impact on PA education, including faculty, staff, and students of the international PA programs.
The original survey is the first of a series of PAEA short COVID-19 impact surveys to collect timely data on how 254 member programs across the US have been impacted and are responding to the pandemic (Physician Assistant Education Association, 2020). The researchers modified the survey to adapt questions for a multinational audience. The modified PAEA COVID-19 impact survey included 34 single or multiple answer questions with embedded open logic questions. Survey questions included the impact of the COVID-19 pandemic on programmatic budget, students, faculty, staff, clinical training, didactic training, and institutional support for these modifications. The web-based software REDCap was used to distribute the survey, collect the responses and store the data. The program directors of international PA programs were invited via email to take the survey from the 7th to 15th of May, 2020, with a reminder email sent on May 11th, 2020. The survey was anonymous, in English, and with no required questions. The University of Utah Institutional Review Board (IRB) gave this project an IRB exemption.

For this project, the researchers define didactic training as lecture format learning typically conducted in-person. Clinical training is defined as the in-person and experiential training that occurs in a clinical setting also referred to as Supervised Clinical Practice (i.e. clinic or hospital). Exploratory data analysis and standard descriptive statistics, including chi-square and dependent group (paired) t-tests, were used to analyse the survey responses. All statistical analyses were performed using SAS software 9.4 and Excel for the graphs.

**Results/Analysis**

The survey link was emailed to 51 program directors of international PA programs and eleven programs (24%) responded. Responses included four programs located in Canada (36.4%), three in the Netherlands (27.3%), two in the UK (18.2%) and one in Switzerland (9.1%), and one in Ghana (9.1%). Table 1 summarizes the program characteristics by country. The programs were mainly publicly funded (81.8%) with the majority of the programs as graduate/master's degree programs (54.5%), and sponsored by a medical institution or an academic health center (AHC) (72.7%). All these programs reported program closure due to the regional policies of limitations of group size for gatherings, and social distancing resulting from the COVID-19 pandemic.

**Table 1: Survey Responses on the Impact of the COVID-19 Pandemic on International PA Programs**

| Programs Characteristics                     | Netherlands/Switzerland | UK | Canada | Ghana | Total |
|----------------------------------------------|-------------------------|----|--------|-------|-------|
| School type                                  | N (%)                   | N (%) | N (%) | N (%) | N (%) |
| Public (government funded)                   | 4 (36.4)                | 2 (18.2) | 3 (27.3) | 1 (9.1) | 9 (81.8) |
| Private, non-profit/Military                 | 0                       | 0         | 1 (9.1) | 0       | 1 (9.1) |
| Program degree                               |                         |           |         |         | 4 (36.4) |
| Bachelor's degree                            | 0                       | 0         | 3 (27.3) | 1 (9.1) | 4 (36.4) |
| Master's degree                              | 3 (27.3)                | 1 (9.1)   | 1 (9.1) | 0       | 5 (45.5) |
| Graduate degree                              | 0                       | 0         | 0       | 0       | 1 (9.1) |
| Certificate degree                           | 1 (9.1)                 | 0         | 0       | 0       | 1 (9.1) |
| Cooperation with a medical institution or an AHC |                       |           |         |         | 8 (72.7) |
| Yes                                          | 3 (27.3)                | 1 (9.1)   | 3 (27.3) | 1 (9.1) | 8 (72.7) |

Current students
| Changes to program’s academic calendar | 0 | 1 (9.1) | 1 (9.1) | 4 (36.4) | 0 | 5 (45.5) |
|---------------------------------------|---|---------|---------|----------|---|---------|
| Delayed transition of students to the clinical phase | 1 (9.1) | 1 (9.1) | 2 (18.2) | 0 | 4 (36.4) |
| Delayed date of program completion | 0 | 1 (9.1) | 2 (18.2) | 0 | 3 (27.3) |
| Delayed graduation | 0 | 0 | 1 (9.1) | 0 | 1 (9.1) |
| Early date of program completion | 4 (36.4) | 2 (18.2) | 3 (27.3) | 1 (9.1) | 10 (90.9) |
| Changes to # direct patient care, hands-on training | 1 (9.1) | 1 (9.1) | 1 (9.1) | 0 | 2 (18.2) |

| COVID-19 pandemic impacts on current students | 0 | 1 (9.1) | 1 (9.1) | 3 (27.3) | 1 (9.1) | 5 (45.5) |
|-----------------------------------------------|---|---------|---------|----------|---------|---------|
| Concern about their finances | 1 (9.1) | 0 | 0 | 0 | 0 | 1 (9.1) |
| Voluntarily decelerated from the program | 1 (9.1) | 0 | 0 | 0 | 0 | 1 (9.1) |
| Involuntarily decelerated from the program | 3 (27.3) | 2 (18.2) | 0 | 0 | 0 | 5 (45.5) |
| Have taken a leave of absence | 1 (9.1) | 1 (9.1) | 3 (27.3) | 0 | 0 | 5 (45.5) |
| Increased stress and other mental health challenges | 2 (18.2) | 0 | 2 (18.2) | 1 (9.1) | 0 | 5 (45.5) |
| Concern about social support | 0 | 1 (9.1) | 4 (36.4) | 0 | 0 | 5 (45.5) |
| Relocated to stay with family | 1 (9.1) | 0 | 0 | 0 | 0 | 1 (9.1) |

| Change individual students’ program completion time | 1 (9.1) | 1 (9.1) | 2 (18.2) | 1 (9.1) | 0 | 5 (45.5) |
|-----------------------------------------------|---------|---------|----------|---------|---|---------|
| Complete program as a class cohort | 1 (9.1) | 1 (9.1) | 1 (9.1) | 0 | 3 (27.3) |
| Complete program asynchronously | 2 (18.2) | 0 | 1 (9.1) | 0 | 3 (27.3) |
| Unknown at this time | 1 (9.1) | 0 | 1 (9.1) | 1 (9.1) | 0 | 3 (27.3) |

| Budget | 3 (27.3) | 1 (9.1) | 1 (9.1) | 0 | 5 (45.5) |
|-----------------------------------------------|---------|---------|----------|---|---------|
| Changes to current fiscal year (2019-2020) budget | 0 | 0 | 1 (9.1) | 1 (9.1) | 0 | 2 (18.2) |
| | 0 | 0 | 0 | 1 (9.1) | 0 | 1 (9.1) |
| | 0 | 0 | 1 (9.1) | 0 | 1 (9.1) | 3 (27.3) |
| | 1 (9.1) | 0 | 1 (9.1) | 1 (9.1) | 1 (9.1) | 5 (45.5) |

| Changes to upcoming fiscal year (2020-2021) budget | 3 (27.3) | 1 (9.1) | 1 (9.1) | 1 (9.1) | 0 | 6 (54.6) |
|-----------------------------------------------|---------|---------|----------|---|---------|
| Changes to current fiscal year (2019-2020) budget | 0 | 0 | 1 (9.1) | 0 | 1 (9.1) | 1 (9.1) |
| | 0 | 0 | 0 | 1 (9.1) | 0 | 1 (9.1) |
| | 1 (9.1) | 0 | 2 (18.2) | 0 | 3 (27.3) |

| Budget | 3 (27.3) | 1 (9.1) | 1 (9.1) | 1 (9.1) | 0 | 6 (54.6) |
|-----------------------------------------------|---------|---------|----------|---|---------|
| Changes to upcoming fiscal year (2020-2021) budget | 0 | 0 | 1 (9.1) | 0 | 1 (9.1) | 1 (9.1) |
| | 0 | 0 | 0 | 1 (9.1) | 0 | 1 (9.1) |
| | 1 (9.1) | 0 | 2 (18.2) | 0 | 3 (27.3) |
The COVID-19 pandemic and the consequent program closure impacted faculty and staff differently (Figure 1). Overall, the reported impact on program staff was higher than faculty (63.6% vs 54.5%, P=0.02). These included hiring suspension or freeze, institutional warning of future layoffs, and lower opportunity to self-quarantine. Delay in promotion process was the same for both faculty and staff (9.1%). At the time of this survey, only one program reported the cutting of development funds for faculty (9.1%).
Concerning clinical practice, the majority of the programs (81.8%), stated that an average of 47.2% ± 29.7% of their faculty practice clinically (Table 2). However, the majority of the programs (63.6%) did not make any changes to accommodate faculty members' clinical practice demands during the pandemic. Only two programs (18.2%) reduced the clinically active faculty's academic workload or shifted their teaching responsibilities to others who were not practicing clinically (18.2%). All program directors, except 1, stated that resources were provided to faculty to support wellbeing and prevent burnout during this challenging time. To meet the needs for online/remote teaching, a majority of the programs provided faculty with software, technology, and hardware for remote teaching (81.8%), training and resources to utilize remote technology (81.8%), and to teach remotely (90.9%).

Table 2: Survey Responses on Faculty Support by International PA Programs during the COVID-19 Pandemic

| Faculty                              | Netherlands/Switzerland N (%) | UK N (%) | Canada N (%) | Ghana N (%) | Total N (%) |
|--------------------------------------|-----------------------------|----------|--------------|-------------|-------------|
| You or any of your faculty also practicing clinically | 3 (27.3) 1 (9.1)              | 2 (18.2) 0 | 3 (27.3) 1 (9.1) | 1 (9.1) 0 | 9 (81.8) 2 (18.2) |
| Provide resources to faculty to support wellbeing/prevent burnout | 4 (36.4) 0 | 2 (18.2) 0 | 4 (36.4) 0 | 0 | 10 (90.9) 1 (9.1) |
| Transition to remote teaching and wellness | 4 (36.4) 0 | 1 (9.1) 0 | 1 (9.1) 1 | 1 (9.1) 0 | 7 (63.6) 2 (18.2) |

Note: Percentages may sum to more than 100% because programs could select multiple impacts.
*p value = 0.02 between impacted faculty and staff
Provide any assistance in transitioning to remote/online teaching

| | 0 | 2 (18.2) | 2 (18.2) | 1 (9.1) | 1 (9.1) | 9 (81.8) | 9 (81.8) | 10 (90.9) |
|---|---|---|---|---|---|---|---|---|
| Not provided support to transition to remote teaching | 4 (36.4) | 2 (18.2) | 2 (18.2) | 1 (9.1) |
| Software, technology, and hardware for remote teaching | 4 (36.4) | 2 (18.2) | 3 (27.3) | 1 (9.1) |
| Training and resources to utilize remote technology | 4 (36.4) | 2 (18.2) | 3 (27.3) | 1 (9.1) |
| Training and resources to teach remotely | | | | 1 (9.1) * |

* Total percentage sum to more than 100% because programs could select multiple answers.

All respondents reported an increase in the proportion of remote teaching due to the COVID-19 pandemic. Programs reported that prior to the pandemic, only 11.8% of didactic curriculum was taught remotely, where at the time of this survey 70.9% of didactic curriculum was reported to being taught from a distance (P <0.01)(Figure 2). Remote clinical curriculum also increased from 6.8% to 38.2% (P=0.02). The survey respondents also noted that remote exam administration increased with didactic exams from 18.6% to 45.9% (P=0.8), and clinical exams from 4.5% to 27.7% (P=0.05).

Suspension of all or some clinical training experiences, as mandated by the institution occurred in over half of the programs (54.6%) (Table 1). In addition, 10 programs (90.9%) stated that all or about half (48.6%) of the clinical training had been suspended by the clinical/hospital sites. In response to the limitation of in-person clinical training, program directors noted several temporary substitutions such as the utilization of SCPEs. Utilization of online modules was ranked the highest among the solutions utilized to meet the programs’ requirements in providing students with clinical experience (72.7%), followed by streamed lectures or other video-conference didactics (63.6%), virtual case-based learning experiences (54.6%), and writing (45.5%) and reading assignments (36.4%). One program (9.1%) reported telemedicine encounters with standardized patients. While two programs already utilized telemedicine training prior to the COVID-19 pandemic, at the time of the survey this increased to 6 programs (54.6%).

All except one program reported changes to quantity of direct patient care hands-on clinical hours per week required to complete a required supervised clinical rotation (90.9%), delayed transition of students to the clinical phase (45.5%), delayed date of program completion (36.4%), and delayed graduation (27.3%) (Table 1). Five programs (45.5%) stated that individual students would complete the program as a class cohort, meanwhile three (27.3%) reported asynchronously program completion. Five programs (45.5%) reported students had concerns about their finances, social support, experienced increased stress or other mental challenges, relocated to stay with family, or had taken a leave of absence. However, voluntarily or involuntarily deceleration from the program was rare (9.1%) at the time of this survey.

One program (9.1%) provided a tuition refund or adjustment if a portion of curriculum was suspended, while the majority (63.6%) did not consider a tuition refund or adjustment (Table 1). Three programs (27.3%) responded that they were incurring additional financial expenses due to necessary teaching and training changes made due to the COVID-19 pandemic. Five programs (45.5%) had not made any changes to the current fiscal year budget, two (18.2%) had cut their budgets. More than half the programs (54.6%) did not make any changes in their upcoming fiscal year budgets.

**Figure 2:** Remote Learning Before COVID-19 and Now among International Programs
Discussion

In many ways, the international PA program responses to the COVID-19 pandemic was similar to the response of United States (US) PA programs with the majority of clinical training suspended and increased impact on the program work environment of both staff and faculty but impacting staff at a greater rate due to COVID-19 (Physician Assistant Education Association, 2020). However, some notable differences were observed, including the suspension of clinical training in the US were initiated more frequently by the clinical site whereas internationally suspension were initiated more frequently by the institution. Also in the US, there was a large increase in use of online formats for testing and teaching. Overall, the response to the COVID-19 pandemic appears to be less drastic in international PA programs compared to US programs. This effect may be due to the difference in education funding models between American institutions and that of other countries. US programs may have less external and institutional funding thus relying more on student tuition, making them more susceptible to changes that might result in enrollment decreases resulting in financial shortfalls. Of interest will be whether program funding models are associated with specific long-term impacts of the pandemic on programs. These differences also highlight the fragmented health system in the US where medical education programs rely on public and private clinics and hospitals to train their students. The Accreditation Review Commission on Education for Physician Assistants (ARC-PA) standards may also be a factor accounting for the more drastic responses of US PA programs, as all US programs have been challenged to meet the ARC-PA standards during the pandemic.

The results of this survey demonstrate the ability of international PA programs that switched the majority of their didactic training to online in the middle of the semester, to successfully respond to the COVID-19 pandemic. Respondents noted a delay in clinical training from the suspension of in-person clinical training, but that the majority of students were reported to be on track to graduate on schedule due to the use of alternative clinical training opportunities. Changes to the status quo were required, and programs adapted to meet the anticipated need, and as a result the international PA educational programs continued training the future health care professionals.

Despite this success in a crisis, the survey indicates that staff, students and faculty have been negatively impacted by the pandemic. It was reported that staff were more greatly impacted due to COVID-19, with less ability to self-quarantine, more hiring suspensions and increased warnings of future layoffs compared to faculty. In addition to a delay in clinical training, programs noted that students have also raised concerns about finances, social support, family responsibilities, increased stress and other mental health challenges. The survey also found that half of the teaching faculty also worked clinically and less than half received an adjustment in teaching workload for the clinical needs of the pandemic. As the pandemic appears less likely to be a short term event and begins to look more
like a long-term challenge, future research should investigate the effects of burnout and attrition on faculty and staff in PA education.

Limitations of this research include the low response rate of the international PA programs, which might have led to survey bias. The inherent differences in management style, assigned responsibilities, and decision making among PA programs located in different countries and different parts of the world will result in the differences in responses to COVID-19. In addition, the actual incidence of COVID-19 in different specific countries, similar to the prevalence of COVID-19 in specific areas of the US during the PAEA COVID-19 rapid response 1 survey likely impacted the survey responses. This study is a snapshot in time, an early in the pandemic response, and therefore the results are limited in their generalizability. Future research should continue to measure the impact of the COVID-19 pandemic on PA education and consider the impact on the global health workforce both in training delay and in limitations of job opportunities.

Conclusion

The COVID-19 pandemic has affected the entire world, including the education and training of the global health workforce. This survey shows the ability of international PA programs to respond to a major pandemic crisis. What we all hoped would be temporary now appears to portend long-term change. As medical educational programs plan for future scenarios that include pandemics like COVID-19, flexible clinical training opportunities that minimize person-to-person interaction need to be developed. The sharing of resources and best practices will help to limit the impact of this pandemic on the future global health workforce.

Take Home Messages

- All international PA programs stopped in-person education due to Covid-19.
- With virtual education modalities, no delay of graduation expected.
- Faculty, and more often staff, were impacted by hiring freezes, warnings of layoffs and inability to self-quarantine.
- Flexible clinical training options that minimize in-person interaction needs further exploration to assure no disruptions in educating the global health workforce.

Notes On Contributors

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Figure 1 and Figure 2: Source: the authors.

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Appendices

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