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Perception of the Theoretical Academic Experience of Residents of Medical Specialties during the COVID-19 Pandemic in a Highly Complex University Hospital

Percepción de la experiencia académica teórica de los residentes de especialidades médico-quirúrgicas durante la pandemia por COVID-19 en un hospital universitario de alta complejidad

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ABSTRACT

The COVID-19 pandemic generated profound changes in the learning and medical education processes. These changes were facilitated, in many cases, by virtual learning tools. Undoubtedly, these tools were of great help to guarantee the continuity of the learning processes; however, it is undeniable that they constitute an alternative that does not replace the acquisition of skills in clinical settings. In general, these changes take on greater significance when we talk about clinical practice scenarios in hospitals, mainly due to the restrictions generated by the pandemic, where access to patients and surgical procedures were significantly affected or decreased. This decrease had a direct impact on the training process for residents of medical-surgical specialties worldwide. In this sense, the need arose to know the resident's perception of the different medical-surgical specialties, in the face of the changes generated by the COVID-19 pandemic in their academic training. A survey was conducted among the residents of the San Ignacio University Hospital to find out their perception. In this article, we present the experience of a highly complex university hospital, which is the practice setting for more than 30 medical specialty programs.

Keywords

COVID-19; medical education; virtual learning; medical specialties; residents.

RESUMEN

La pandemia por COVID-19 generó profundos cambios en los procesos de aprendizaje y de educación médica. Estos fueron facilitados, en muchos de los casos, por herramientas de aprendizaje virtual, que fueron de

gran ayuda para garantizar la continuidad de los procesos de aprendizaje. Sin embargo, estos cambios adquieren un mayor significado cuando se habla de los escenarios de práctica clínica en hospitales, debido a las restricciones generadas por la pandemia, y por las cuales el acceso a pacientes y procedimientos quirúrgicos se vieron significativamente afectados o disminuidos. Tal diminución repercutió en el proceso de formación de los residentes de especialidades médico-quirúrgicas en todo el mundo. En este sentido, surgió la necesidad de conocer la percepción de los residentes de las diferentes especialidades médico-quirúrgicas, mediante una encuesta, frente a los cambios generados por la pandemia por COVID-19 en su formación académica. Así, en este artículo se expone la experiencia de un hospital universitario de alta complejidad, el cual es escenario de práctica de más de treinta programas de especialidades médicas.

Palabras clave
COVID-19; educación médica; aprendizaje virtual; especialidades médico-quirúrgicas; residentes.

Introduction

The COVID-19 pandemic generated great and profound changes in all aspects of life, so abruptly and rapidly that no one could have imagined. These have had repercussions, among many other aspects, in the educational processes of medical residency programs (1,2). Medical education underwent important and sudden changes, to which both students and teachers had to adapt, assuming the new challenges brought about by the pandemic.

The recommendations of the regulatory bodies were initially very strict and established multiple restrictions, several of which were to maintain physical distance, limit meetings involving groups of people in closed places (including academic meetings), as well as to seek generalized isolation. Undoubtedly, such restrictions directly impacted medical education and limited face-to-face attendance. However, medical education has always been understood as a process that requires and implies face-to-face interaction between teachers and students, in which there is usually teacher supervision in different clinical practice scenarios. Thus, it was a great challenge to assume and understand the virtualization of medical education, as a great change derived from the restrictions due to the COVID-19 pandemic (3,4).

With this in mind, it is important to highlight that in the health care setting, local epidemiological conditions have irremediably modified the number, volume, and characteristics of the patients attended; the exposure to procedures and interventions, and the daily clinical experience, and in the clinical teaching processes, the continuity of the curricular academic sessions, as well as the educational modalities used by teachers and students (5,6). While it is true that virtualization of content as an alternative will not replace the acquisition of skills in clinical settings, it is an undeniable reality that during these critical months it has been the main teaching tool in many residency programs around the world, some of which, out of necessity, have even suspended the attendance of graduate students to their practice settings altogether (7-9).

It is difficult to think of virtualization as a fundamental axis of medical education; however, this is the reality to which we have been abruptly thrown into. This is why it should perhaps be thought of as a complement to the different activities that make up medical education; a complement that for now occupies a fundamental place in the training processes and that will continue to occupy an important place in the coming years. But we cannot overlook the crucial role played by clinical practice scenarios, which are fundamental for medical education. The pandemic will certainly have greater repercussions in some fields of medicine, especially in the surgical field, where clinical practice has been more than modified.

Many researchers in different parts of the world have made an effort to describe and share their experience regarding the changes generated in medical education by the COVID-19 pandemic. In general, they coincide in showing how each one, from their experiences, has been able to face them and how they have adapted to maintain the quality and continuity of medical education. However, very few have focused on describing the perception of residents or teachers on the changes brought about by the pandemic (10-14). In this article, we will not only refer to the changes in the educational processes that we

have experienced locally but, in turn, we intend to highlight the perception that residents have had in their training process during these months.

Methods

This was a retrospective descriptive study. In July 2020, the "COVID-19 Contingency Resident Survey" was implemented, which was electronic, voluntary, and anonymous. It was sent by institutional e-mail to all residents of medical specialties, both clinical and surgical, rotating at the Hospital Universitario San Ignacio (HUSI). The survey was completed by 299 residents. Initially, the survey was implemented and then the research protocol was developed based on its results, and therefore this is a retrospective study.

All HUSI residents who completed the survey were included. No exclusion criteria were established. And, to describe the variables to be evaluated, the data extracted from the survey were reviewed and taken. Absolute and relative frequencies were used to describe the categorical variables. The survey had different questions, mainly related to theoretical academic activities (master classes, subject reviews, journal club, among others). The survey did not include questions specifically related to clinical practice or care scenarios, which would correspond to practical academic activities (for example perception of surgical procedures, perception of the new epidemiological profile of patients, perception of the change in care load, etc.). In addition, the survey did not directly ask students to make a comparison with academic activities before the onset of the pandemic. The survey questions were oriented to know the current perception of the residents with the virtualization of academic activities.

The experience of a high complexity university hospital

HUSI is a highly complex hospital with more than 11 services and 17 units, comprising 17 clinical specialties and 21 surgical specialties. Additionally, it is the training scenario for 31 specialization programs or medical residencies of the Pontificia Universidad Javeriana. As of 2021, more than 397 residents from different clinical and surgical specialties will rotate in the different services and units.

As of March 16, 2020, the Pontificia Universidad Javeriana suspended face-to-face academic activities for all students, including those of the School of Medicine. This resulted in a considerable reduction in exposure to clinical practice scenarios, to reduce the risk of contagion and ensure the safety of both teachers and students. As a strategy to adapt to the pandemic, the clinical rotations of the residents were adjusted (3). For theoretical academic activities (seminars, classes, academic meetings, etc.), virtual strategies were defined, through the different platforms available, with to minimize the presence in the classrooms and maintain the recommendations of physical distance, and thus minimize the risk of contagion due to exposure of clinical teams and the general population (6,15,16).

The Pontificia Universidad Javeriana and the HUSI provided great support to teachers and students in the training for the use of these new technologies that allowed continuity in the training processes. Among the technological platforms available, the most widely used at HUSI for theoretical academic activities was Microsoft Teams, which is the official institutional platform. Through this platform, different theoretical academic activities are carried out between teachers and residents. Other platforms have been used less frequently, such as WebEx and Google Meet.

Based on all the changes implemented, it was necessary to know the perception of the residents rotating at HUSI during the COVID-19 pandemic, regarding their academic experience with virtual teaching strategies. In that order of ideas, it was proposed to survey them, to identify barriers or aspects in which the digital tools for medical education could be improved or optimized; aspects that could have a direct impact on the training of residents.

As shown in Table 1, a wide variety of clinical and surgical specialties participated in the survey.

The variation in the number of participants per specialty is mainly due to the number of slots available in each specialty, i.e., specialties with a greater number of residents had a higher participation (pediatrics, emergency medicine, internal medicine, gynecology and obstetrics, and anesthesiology).

Table 1.
Participation in the survey by specialty

Specialty	Participation
Cardiology	20
Cardiovascular surgery	3
General surgery	3
Maxillofacial surgery	9
Plastic surgery	2
Dermatology	7
Endocrinology	2
Pediatric Endocrinology	2
Clinical epidemiology	2
Gastroenterology	8
Medical genetics	7
Geriatrics	6
Gynecology and obstetrics	19
Hematology and oncology	20
Pediatric hematology and oncology	1
Emergency medicine	2
Family Medicine	26
Internal medicine	16
Nephrology	22
Neonatology	3
Pneumology	5
Cardiology	2
Neurosurgery	6
Neurology	2
Ophthalmology	6
Orthopedics and traumatology	10
Otorhinolaryngology	8
Pathology	2
Pediatrics	50
Psychiatry	12
Child and adolescent psychiatry	2
Radiology	10
Urology	4
Total	299

Academic activities

Cancellation of academic activities

During the COVID-19 pandemic, efforts have been made to ensure the continuity of academic activities at HUSI. According to the survey, only 28% of the programmed activities in the different specialties were cancelled, which means that in 72% of the cases the programmed activities continued without setbacks, as can be seen in Figure 1. However, the specialties in which there was a higher frequency of cancellation of programmed activities were Pathology, Anesthesiology and General Surgery.

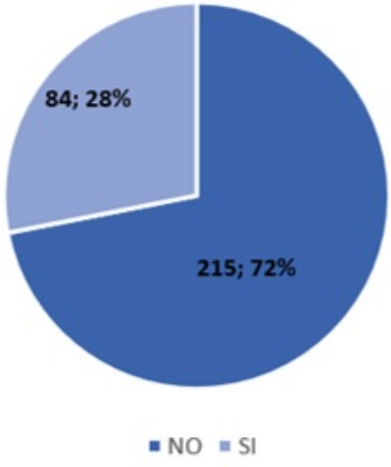

Figure 1.
Cancellation of scheduled academic activities

Virtualization of academic activities

Regarding the virtualization of activities, it was observed that 40% of the residents who responded to the survey stated that 100% of the academic activities were virtualized, as can be seen in Figure 2. Only 8% of the residents who responded to the survey stated that the frequency of virtualization of scheduled academic activities was less than 30%. With this in mind, in all specialties the theoretical academic activities were virtualized. Among the specialties that had a higher frequency of virtualization were: Hematoncology, Psychiatry and Urology.

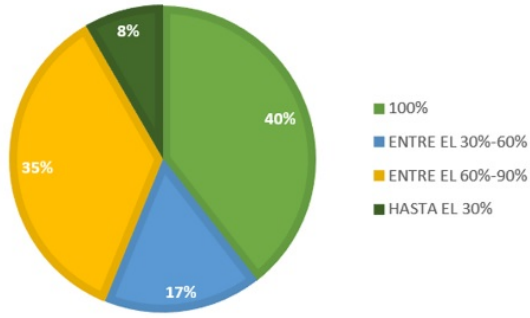

Figure 2.
Percentage of activities that were carried out virtually

Quality of academic activities

Undoubtedly, the quality of theoretical activities during the COVID-19 pandemic has been a variable of great importance. One might think that virtualization could lead to a decrease in the quality of academic activities. It is important to mention that quality, in many cases, will depend on the availability of innovative technological tools that guarantee a dynamic learning process. The survey shows that 27% of the residents consider the quality of the activities to be "excellent", followed by "good" (64%). Only 9 % of the residents consider the quality to be fair.

Frequency, schedule, duration and quantity

In general, most residents considered both the frequency and the schedule, duration, and quantity of academic activities to be adequate, as can be seen in Figure 3. For 89 % of the residents the frequency of activities is adequate, for 81 % of the respondents the schedule is adequate, for 82 % the duration of academic activities is adequate and for 80 % of them the

quantity of academic activities is adequate. A small proportion of residents considered that they were not adequate.

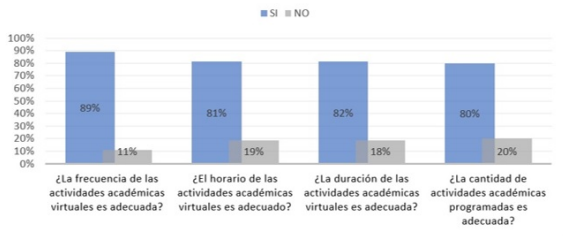

Figure 3.
Virtual academic activities

Type of academic activities

Within the different types of academic-theoretical activities, master classes were the most performed virtually (75.3 %), followed by clinical case review (73.2 %) and correlation cases (31.8 %). The journal club and photo club had a low frequency of realization in all specialties. This could have repercussions in some specific specialties, such as Dermatology, Pediatrics and Radiology, in which these activities form a very important part of the training process (Table 2).

Table 2.
Type of academic activities

Type of academic activities	Percentage	Number of students
Master classes	75.3	225
Review of clinical cases	73.2	219
Correlation cases	31.8	95
Journal Club	0.3	1
Photo Club	3.3	10
All of the above	8.7	26

Discussion

The COVID-19 pandemic has brought with it great challenges and consequences in medical education, both locally (9) and globally (10-13). Medical schools in the country were forced to abruptly suspend all face-to-face activities. Hence, different medical schools have made a great effort, not only financially but also in terms of human resources, by investing in virtual platforms that guarantee the continuity of the students' training processes. The fundamental axis throughout this process of change has been to maintain the continuity and quality of the training processes, in such a way as to minimize the repercussions that can occur when we think of medical education as separate from clinical practice scenarios.

Hence, in this whole process, the virtualization of academic activities has constituted a new reality, in which informatics tools have played a fundamental role. This has highlighted the need for innovative digital technologies and resources to ensure the quality of medical education, because the long-term impact of the pandemic is still unknown, but is presumed to be considerable.

The "COVID-19 Contingency Resident Survey" provided insight into residents' perception of the major changes generated by the COVID-19 pandemic in their training process as specialists. Although many researchers around the world have shared their experience regarding the adaptation of the educational processes to the changes and restrictions derived from the COVID-19 pandemic, very few have focused on the perception of the residents (students) in the face of these changes.

Shima Tabatabai (8), in his article on the impact of COVID-19 and virtual medical education, explained how medical education has had to be transformed into a virtual process. We agree with the author that the priority should be the safety of both students and teachers. However, continuity in the training processes cannot be overlooked. In addition, we agree on the importance of computer resources and how adjustments should be made—in some cases, information systems should be strengthened—to guarantee the quality of educational processes in medicine. Finally, we agree that the virtualization of medical education is a reality that will surely remain in time, possibly with progressive changes

and reductions in the use of computer tools, but that it will undoubtedly continue to play an important role in medical schools.

Dedeilia et al. (15) conducted a systematic review of the challenges and innovations in medical education during the COVID-19 pandemic, in which 61 articles were included. Regarding the challenges, we agree with the authors on the great decrease in face-to-face attendance in clinical practice settings, which translates into a decrease in direct contact with patients. However, with respect to innovations, we agree that the virtualization of medical education made it necessary to create innovative strategies (teleconferencing, online classes, among others) to guarantee the quality and continuity of medical education.

One of the limitations of this study is that the survey did not include questions related to the practical academic activities of the residents, i.e., concerning the perception of the care activities of the residents in clinical practice scenarios. The questions contained in the survey were oriented to know the perception of the residents regarding mainly theoretical activities (master classes, journal club, topic reviews, etc.). In this order of ideas, it was not possible to know or have information on the practical-assistance activities, which are undoubtedly of great value.

At HUSI, face-to-face academic activities were quickly suspended and, to guarantee their continuity and quality, they were adapted to virtuality. We consider that the virtualization of medical education is a reality to which we have adapted and which will surely continue to be important in the coming years. Despite the advent of vaccines, measures continue to be implemented to minimize the risk of contagion for both teachers and students.

Thus, it has been possible to maintain the safety of both teachers and students during the pandemic, and a great effort has been made to maintain quality theoretical academic activities through the available virtual platforms. In general, this adaptation has been perceived positively by the residents. It is undeniable that clinical exposure time decreased significantly and the repercussions of this important limitation are still unclear.

Conclusions

The COVID-19 pandemic has influenced all educational processes and all aspects of them. Undoubtedly, medical-surgical specialties have not been the exception. The pandemic has forced us to adapt to a new reality in which virtualization has been the protagonist.

Educational strategies have changed drastically and have involved a rapid adaptation of both students and teachers to new information technologies. For some programs, large investments were necessary to strengthen virtual education through various computer platforms.

The decrease in exposure to clinical scenarios, as well as the change in the epidemiological profile of hospitals, will have repercussions on the training of residents. For this reason, efforts should be made to maintain high-quality theoretical and practical academic activities, which in some way reduce the consequences of the decrease in the burden of care and presence in clinical practice scenarios. The survey conducted at HUSI allowed us to understand locally the perception that residents have had of all these changes, and from which a positive perception was found in all specialties regarding the continuity and quality of theoretical academic activities.

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Conflict of interest

The authors declare no conflict of interest.

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