

# Experience of the Department of Pediatrics in the Use of Remote Tools for Academic Continuity at the Pontificia Universidad Javeriana, during the SARS-CoV-2 Pandemic in 2020

## Experiencia del Departamento de Pediatría en el uso de herramientas remotas para la continuidad académica en la Pontificia Universidad Javeriana durante la pandemia por SARS-CoV-2 en el 2020

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### ABSTRACT

Medical education has been confronted with the rapid changes that occurred as a result of the SARS-CoV-2 pandemic. The Pediatrics Department of the Faculty of Medicine of the Pontificia Universidad Javeriana have faced the need of modifications and have encountered challenges of new technologies giving academic continuity to undergraduate and postgraduate programs in the area of pediatrics, as well as adjusting practices to ensure medical training. In this article we present the experiences and reflections of changes related to medical training and new technologies in Pediatrics learning.

**Keywords**

education; remote tools; pandemic; SARS CoV2; academic continuity.

**RESUMEN**

La educación médica se ha visto confrontada frente a los rápidos cambios debidos a la pandemia por SARS-CoV-2. Los profesores del Departamento de Pediatría de la Facultad de Medicina de la Pontificia Universidad Javeriana se han enfrentado a la necesidad de hacer modificaciones y afrontar los retos de las tecnologías para dar continuidad académica a los programas de pre y posgrado en el área de la pediatría, así como ajustar las prácticas para garantizar la formación médica. En este artículo exponemos las experiencias y reflexiones del departamento.

**Palabras clave**

educación; herramientas remotas; pandemia; SARS CoV2; continuidad académica.

**Introduction**

The emergence of SARS-CoV-2 since the end of 2019 has generated major individual and collective changes in everyday life. The coronavirus pandemic forced "social distancing", which occurred differently in each country. As in all aspects of life, education was also involved.

On March 23<sup>rd</sup>, 2020, the Association of American Medical Colleges issued a statement on the involvement of medical students during the current pandemic caused by COVID-19. They recommended that students not participate in direct patient care unless there was a critical need and only on a voluntary basis (1).

In Colombia, the regulations adopted to confront the pandemic were resolutions and decrees that initiated the quarantine and ordered, among others, the suspension of classes and university student practices (2, 3). Undergraduate medical students were isolated from clinical practice settings in hospitals and outpatient centers, as well as from classrooms and other practice spaces (4). Similarly, there were changes in the practice of postgraduate students, as a consequence of the changes in the use of healthcare services due to quarantines and the fear of contagion. This article presents the experience of the Department of Pediatrics of the School of Medicine of the Pontificia

Universidad Javeriana in the face of the changes brought about by the pandemic and the national and local regulations in the undergraduate and postgraduate educational process.

**Changes at Pontificia Universidad Javeriana**

Since March 2020, the Pontificia Universidad Javeriana, in accordance with the new and changing national and district regulations and decrees, conducted massive courses, workshops and training to quickly train all teachers in the use of information and communication technologies (TIC, for its acronym in Spanish), which allowed a timely and short time shift to the use of remote teaching tools to ensure the continuity of education at the university. The School of Medicine offered several courses and tutorials on tools such as Microsoft Teams®, Zoom®, Blackboard®, Blackboard Collaborate Ultra® and KuraCloud® to faculty and administrative staff. Audiovisual material was also developed for permanent consultation and to encourage self-training.

**Experience of the Department of Pediatrics**

In the Department of Pediatrics of the School of Medicine of the Pontificia Universidad Javeriana, computer tools were gradually being implemented in the teaching process. However, it was necessary in record time to rethink their use and through the Teams®, Blackboard Collaborate Ultra® and KuraCloud® platforms, provided by the University, to establish training, access and implementation of these tools by all the participants involved. The teachers adapted, as well as the students, to give continuity to learning and build knowledge.

Unbeknownst to them, the pandemic has brought the TICs not only to patient care but also to medical education for pediatric students in an innovative way. Below, we present the Department's experience in the use of remote education tools with each group of students

involved in the teaching process in the area of pediatrics.

### Undergraduate experiences

Since 2014, the Medicine career implemented a curricular reform that entailed a change in many of the teaching practices. It became an opportunity to provide students with learning systems and a curriculum that seeks to develop competencies and evaluate them, based on highly integrated meaningful learning, allowing the student to acquire tools for lifelong learning—rather than focused on content, early exposure to the clinic and first-level care scenarios—as well as knowledge of the health system with content focused on priority and flexible problems. This implementation in educational change introduced innovations in all areas.

Throughout these years, in the Maternal and Child subject, undergraduate students have had an approach to virtual tools for the enrichment of medical English, using Microsoft Stream®, with audiovisuals that allowed mobilizing the student to a digital environment for medical training. Different virtual tools have been used, the organization of the thematic content in Blackboard®, which even allows evaluation through the platform.

Due to the preventive isolation, the possibility of changing the training arose. New strategies were proposed, such as virtual clinical simulation, based on real clinical situations which made it possible to maintain the continuity of the curriculum throughout the semester. Likewise, classes, seminars and group workshops with facilitators and their feedback continued using Teams® or Blackboard Collaborate Ultra® platforms.

Concomitantly, teachers were trained in the different learning scenarios, exploiting their capabilities to conduct a different class with the purpose of keeping the students' interest intact and guaranteeing the continuity of the curriculum in a scenario of uncertainty. Likewise, students were immersed in the use of the

knowledge transmission tools provided by the university.

The incorporation of these resources is part of the contribution to medical training. From our teaching experience, these tools have managed to become that mediating action so that different types of scenarios can be created and so that the student has the knowledge at hand.

In this contingency, work was carried out in teaching environments that favored the adequate fulfillment of the expected learning outcomes set forth in the program (RAE), as indirectly observed in the average grades obtained in the pediatrics component in the third academic period of 2019: 4.1 (SD = 0.2) and third academic period of 2020: 4.3 (SD = 0.17).

An example of the activities carried out corresponds to the adaptation of the workshop for training in developmental screening in children under 7 years of age, using the Abbreviated Developmental Scale version 3 in-person with the application of the different tests and observations through role-playing to a modality with the use of the TICs, in which 10 videos were first presented with evaluators and children of different ages.

Then, in each subgroup they discussed each video identifying the errors and successes in the evaluation and then choosing a group to present their conclusions until completing the discussion of all the material and filling out an evaluation form to classify the children's development.

Another example is in the fourth term, with the Child Neurodevelopment class where the flipped classroom technique was applied. The technique meets the following requirements: students are the protagonists, they learn by doing and not by memorizing. They study and present the subject, they have time available before the session to review the topics and prepare the presentation, they work collaboratively and use technological tools. As a reference, they were given a series of videos in which the progression of neurodevelopment in the different areas is analyzed with their respective experiments. The students had to make a new video that lasted a maximum of 10 min, where they captured the important messages of the

references didactically so that their classmates would receive the information. As a result, the groups presented their own cartoon videos, Power Point® presentations with images and voices, and other types of videos that they posted on YouTube® with annotated sections of the references. These videos were reviewed in a synchronous class session remotely with the assistance of the students, doubts were solved and the professors developed the conclusions of the topic. This material was available with unlimited access. In contrast to the in-person exercise, in which the moment was worked, with video recording we observed greater detail and depth in the concepts due to the awareness of permanence and self-reflection that this type of recording generates.

### **Experiences with internship students**

Students in the last semesters of the internship (XI and XII) adapted to the alternating method. Half of their rotation was carried out in-person and the other half virtually. Therefore, it was imperative to create a channel through the Teams® platform and, thus, workshops, clinical cases and topic reviews were developed.

At the beginning of the pandemic, two groups were assigned to provide continuity of care at the practice site. Monday, Wednesday and Friday, one group attended, and Tuesday, Thursday and Saturday, the other group attended. The days were then reversed in the following weeks of the month. Evening and weekend shifts were suspended to minimize exposure to COVID-19. The rest of the time they were in the virtual classroom created. As the conditions established by the government for the confinement changed, adjustments were made in the distribution of the practices to increase the time of assistance activities of the cycle in which this group of medical students was.

The groups of interns rotating in Pediatrics vary between 5 and 12 students per month, which facilitated student-student and student-teacher interaction in the virtual tools. During the development of the activities a greater

communication between each of the participants of the teams formed through the platform was perceived.

The teachers noted a great commitment of the students in academic activities, through the expression of opinions, points of view, the development of seminars, proposals of topics to be reviewed and leadership in the execution of the activities, in such a way that they were the main actors in their learning process. The teacher accompanied the process, actively answered questions and provided clarifications when appropriate.

The use of virtual tools for communication fostered creativity in teachers and students. It has been a bidirectional learning process where the organization of time has allowed to deepen in a greater number of topics and has favored that students have the opportunity to deepen in topics with the accompaniment of subspecialists in different areas of pediatrics.

### **Experience with graduate students**

For postgraduate students at the Pontificia Universidad Javeriana, the decision was made to reduce their exposure during internships to reduce the risk of contagion, and adjustments were required in their rotations as well as in the lectures and seminars that were given in-person.

Specifically, for the students of the Specialization in Pediatrics and the Specialization in Neonatology, the pandemic entailed changes in their learning schemes and a new approach in the dynamics of their rotations. The academic and assistance activities were adjusted for teachers and students with the purpose of achieving the expected learning results, consolidated work teams and fulfillment of goals in spite of the challenges.

Virtuality was included in the teaching through various tools. Theoretical sessions were implemented with the discussion of topics by using different platforms, such as Teams®, Zoom® and Google Meet®, under the guidance of teachers. In addition, the journal clubs, spaces where participants search for an article related

to a selected topic and then conduct a critical analysis from the perspective of evidence-based medicine using virtual tools, were maintained.

The weekly presentation of clinical cases was developed through the Teams® platform by the different areas (emergency, hospitalization, newborn unit, outpatient and subspecialties), with the group discussion on the approach and management of the patient, including undergraduate and postgraduate students.

Concerning the workshops that were usually conducted practically at the Clinical Simulation Center, different strategies have been used with videos and virtual meetings of inverted sessions that allowed them to consolidate the theory and reinforce the techniques while opening the possibility of resuming the practices. Once they returned to the Simulation Center, a greater mastery of the subject was observed, which favored the development of the practice with a better use of time.

Regarding administrative and hospital management activities, the Pediatrics and Neonatology residents have participated in the analysis of clinical safety events, performed using the London Protocol. They continued with the monthly meetings of the reported events to perform the group analysis with the mentioned tool. Along the same lines, they participated in multidisciplinary meetings for difficult patient cases, seeking solutions and joint decision making along with the Clinical Ethics and Pediatric Palliative Care service, using the TIC.

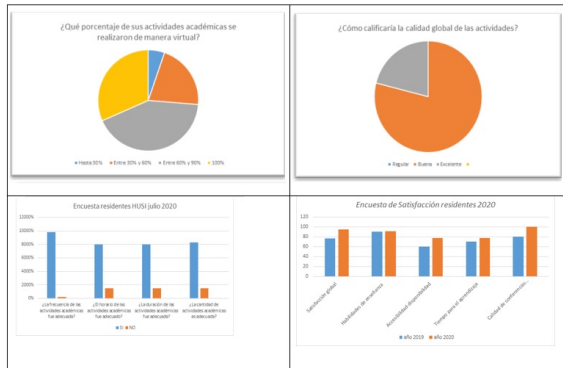
It is worth highlighting the strategies used in Neonatal Unit Administration and Management, as well as in the subject Quality and Audit of Neonatal Health Services, activities that facilitated learning from virtuality through dynamics, such as simulation with roles in a platform, in which the work group simulates a particular situation and roles are assigned to evaluate the application of the concepts reviewed. The virtual selection activity was also implemented, which is conducted after reviewing a topic with a quiz where the correct answer is selected in the shortest possible time. In addition, a fair-type dynamic stands out within these

methodologies in which the student is assigned a specific topic that he/she must offer to the public by providing convincing and well-founded information.

Pediatric postgraduate students have had the opportunity to attend consultation and patient care remotely through virtual platforms. Several of the pediatric subspecialties, such as Endocrinology, Rheumatology, Pneumology, Nephrology, Palliative Care, Hematology and Gastroenterology have developed their outpatient agendas through this tool. Faculty members conduct the consultation via video call on platforms such as Teams, Skype for Business or WhatsApp. The students are present during this care, with prior authorization from the patient's family members. Through the teleconsultation, they learn the different reasons for consultation, clinical picture and, in general terms, the necessary information to take the corresponding behaviors. It is possible that this strategy partially mitigates the decrease in the timeliness of in-person patient care and, in general, in clinical practice.

Pediatrics and Neonatology postgraduate students rated the activities implemented so far as satisfactory and highlighted that the goals have been met in terms of the proposed learning outcomes. The Hospital Universitario San Ignacio (HUSI) surveyed postgraduate students in July 2020 about the virtual activities. The results obtained for the Department of Pediatrics, with 100% participation of Pediatrics and Neonatology residents, are shown in Figure 1.

**Figure 1.**  
Results of the satisfaction evaluation survey of the Pediatrics and Neonatology specialization programs: 2020-1 (n = 23)



In the same survey, Pediatrics and Neonatology residents reported that they were exposed to master classes, clinical case reviews, correlation cases and journal clubs with virtual education tools. Regarding resident satisfaction surveys, there was improvement in issues related to time and teaching modalities, compared to the previous year.

The commitment on the part of teachers and students allowed to generate different dynamics in education with a favorable perception on the part of the students. However, these circumstances and strategies that we use, pose challenges as teachers, as well as open new paths and questions for the future.

### Experience in teaching research

For the research component of the postgraduate programs of the Department of Pediatrics, the tutorial model for developing these processes was continued. Teams® meetings were established with the students and other members of the research teams, when possible. This tool facilitated the exchange of files, simultaneous work in the research teams and follow-up of the students' progress.

Likewise, there were progress support sessions and presentation of the research projects results. Moreover, students have incorporated the use of TICs in their projects to be able to conduct

research and solve the logistical difficulties generated by quarantine, confinement measures and prevention of contagion.

In this way, the students' work and the development of their research skills have been maintained at a good pace, with a lower number of displacements, which makes us consider maintaining this type of tool in the teaching and learning processes in the future.

### Discussion

The COVID-19 pandemic has posed challenges to the continuity of medical student learning. Historically, teaching has been in-person, but nowadays it has been necessary to contain non-essential medical personnel and close educational institutions to maintain social distancing (1, 2, 3).

At the Pontificia Universidad Javeriana, on March 16, 2020, academic activities were suspended for all students and a week was given to adjust a teaching plan and academic continuity. This situation of changes in academic and practical activities in medical education also occurred in other universities in the country and worldwide (5). Medical educational institutions have been transformed and have appropriated different tools to give continuity to their objectives and report experiences similar to those presented in this article and some with promising results (6, 7, 8). As well as the experience reported by Sharp et al. (7), the Pontificia Universidad Javeriana has been making efforts in complementary training in virtual and combined educational strategies for professors of all areas, including those of the School of Medicine, both clinical and non-clinical.

It is well known that the cornerstone of medical education is patient care, and educational institutions had to find ways to minimize the current gap between the clinic and virtual tools. Teaching methods have had to evolve by using digital applications that were not used massively before, as is the case of this experience. The TICs have become essential

tools now and could become consolidated in teaching in the long term.

Dedeilia et al. (9), in their systematic review on challenges and innovations in medical education in the COVID-19 era, included 61 articles on the subject of study, whose texts were analyzed and summarized around two axes: challenges and innovations. Regarding the former, we shared similar experiences concerning a decrease in clinical exposure, particularly at the undergraduate level due to the closure of practice scenarios; at the postgraduate level, adjustments in some rotations due to a decrease in the consultation of some groups of patients, with a significant reduction in direct contact with patients, all in the interest of minimizing the risk of contagion. Among the innovations identified in the study, we also share similarities with those documented in their review, in which they report the implementation of teleconsultation, teleconferences and webinars, asynchronous and synchronous online class sessions and simulation, among others (9).

For the Department of Pediatrics of the Pontificia Universidad Javeriana, the pandemic has affected the use of time for academic activities of both teachers and students, which has led to a greater number of theoretical activities. Specific schedules have been established, which are less modifiable and more rigorously followed. There is less repetition of activities and they reach a wider audience. There is now less “dead time,” such as time spent on traveling or activities that used to interfere with the fulfillment of these learning spaces. On the other hand, the clinical exposure time was reduced, so compensation strategies were sought by using the TICs in the context of patient care.

### **What should we consider in the near future and what are the challenges for medical education in pediatrics?**

Telemedicine has grown exponentially recently: it has expanded from telephone or virtual encounters involving mental health, to specialized consultations, to post-surgical follow-

up. These tools, with proper training, can foster the acquisition of skills to successfully use them. With adequate resources, these skills can be taught and thus become a component of medical school curricula; they could even be taught in parallel (5). However, permanent use may lead to difficulties in acquiring the skills to conduct an adequate interview in a face-to-face setting and to perform the physical examination.

Over the years, the technology has matured. Simulators are as effective as live patient-actors for teaching (10). The current situation calls for the use and promotion of these pedagogical innovations, as there is a need for e-learning modules (Flash multimedia and digitized images), patient surrogates such as virtual patients (to teach clinical examination techniques, procedures, diagnosis and communication) and virtual reality simulators (to teach palpation, surgery and resuscitation techniques). Furthermore, while the advantages of technology in teaching are undoubted, these tools do not replace the learning that comes from exposure to real patients. Thus, they can be complementary to clinical teaching, but not a substitute for it (11).

Many of the trainees are at levels of training where high clinical exposure is required to acquire competencies and skills in certain areas of the medical profession (12). Decreased exposure to the clinical environment due to the effects of the pandemic, will likely have repercussions for future performance in certain areas of the medical profession, the impact of which requires further study.

On the other hand, telemedicine currently offers a wide variety of opportunities for the education of medical students during the current COVID-19 pandemic. Thus, some medical schools have included telemedicine within their programs as a means of providing continuity in their academic activities (9). We are at a learning interface where it is likely that many will choose to continue to use telemedicine in the future.

In accordance with these discussions and approaches, the Department of Pediatrics faces the challenge of offering teaching with the quality that characterizes it, adopting and adapting the

TICs to the institutional context, to minimize the impact that the modification may have on the usual clinical practices and maintaining in the long term those strategies that favor and complement the learning of clinical skills. These transformations have been assumed as a fundamental part of facing this new challenge presented by the pandemic worldwide.

## Conclusions

The pandemic has brought new challenges for everyone in different scenarios, and medical students have decided to face these changes with optimism and have provided different strategies for individual study.

It has been a period of transition in the way of teaching and learning, and students are more aware of the dynamics of self-learning, responsibility and the importance of the proper use of personal protective equipment.

As responsible for the academic continuity, the university has provided support and tools for both teachers and students, to achieve an adequate fulfillment of the objectives.

In the Department of Pediatrics of the Pontificia Universidad Javeriana, a rapid adaptation was achieved to guarantee the continuity of medical education at all levels of training by using virtual tools for communication. The general perception is that for purely academic activities, these strategies have allowed better time management for teachers and students. However, there is concern about the repercussions that the reduced exposure time to clinical activities may have on the performance of future professionals.

There are various virtual resources available for students and teachers: videoconferences, seminars, virtual workshops, among others. Distance learning has been a challenge for clinicians and has made the way of teaching medicine more flexible and complementary. For this reason, it is necessary to continue investing in pedagogical innovations and research in medical education.

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