

Increased Use of Scheduled Teleconsultations and Asynchronous Portal Messaging in Primary Care

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ABSTRACT

Introduction: during the COVID-19 pandemic, there was an unprecedented boom in telemedicine, probably due to the forced adoption of technology in the face of restrictive measures. This study aimed to compare the interaction and communication between general practitioners and patients before and during the pandemic based on scheduled outpatient consultations and Health Portal messages.

Materials and methods: Cross-sectional study with a consecutive sampling of scheduled appointments and messages, occurring between epidemiological weeks (EW) 10 and 23 of 2019 and 2020, respectively. We included 147 physicians from the Family and Community Medicine Service and a capita of 73427 patients affiliated with the Hospital Italiano de Buenos Aires health plan. We conducted a quantitative and qualitative analysis.

Results: there was a 70% reduction in face-to-face consultations (from 76375 in 2019 to 23200 in 2020) and a concomitant increase in teleconsultations (from 255 in EW13 to 1089 in EW23). Concurrently, messages increased substantially (from 28601 in 2019 to 84916 in 2020), with an abrupt onset at the beginning of confinement and a decreasing trend over time. Before the pandemic, the content involved electronic orders for complementary studies, outcome monitoring, chronic medication prescriptions, or expert consultations. The most frequent domains during the pandemic were epidemiological information needs, such as preventive measures for COVID-19, pneumococcal vaccine, influenza vaccine, cases or suspicions, and swab results, among others.

Conclusion: the rise of communication and information technologies during the pandemic allowed the continuity of healthcare processes despite the physical distance. There was increased use of messaging for patients' information needs, and the doctor-patient relationship has changed.

Key words: remote consultation, teleconsultation, telemedicine, e-accessibility, primary health care, Argentina

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RESUMEN

Introducción: durante la pandemia de COVID-19 hubo un auge sin precedentes de la telemedicina, probablemente por la forzada adopción de tecnología ante las medidas restrictivas. El presente estudio se propuso comparar la interacción y la comunicación entre médicos de cabecera (MC) y pacientes, antes y durante el período de pandemia, en términos de consultas ambulatorias programadas y mensajes del Portal de Salud.

Materiales y métodos: corte transversal con muestreo consecutivo de turnos programados y mensajes, ocurridos entre las semanas epidemiológicas (SE) 10 y 23, de 2019 y 2020, respectivamente. Se incluyeron 147 médicos del Servicio de Medicina Familiar y Comunitaria, y una cápita de 73 427 pacientes afiliados al Plan de Salud del Hospital Italiano de Buenos Aires. Se realizó análisis cuantitativo y cualitativo.

Resultados: hubo una reducción del 70% de las consultas presenciales (de 76 375 en 2019 a 23 200 en 2020) y un aumento concomitante de teleconsultas (de 255 en la SE13 a 1089 en la SE23). En simultáneo, los mensajes aumentaron sustancialmente (de 28 601 en 2019 a 84 916 en 2020), con un inicio abrupto al comienzo del confinamiento, y una tendencia decreciente a lo largo del tiempo. Antes de la pandemia, el contenido estuvo relacionado con órdenes electrónicas de estudios complementarios, control de resultados, recetas de medicación crónica y/o interconsultas a especialistas, mientras que los dominios más frecuentes durante la pandemia fueron necesidades informativas epidemiológicas, como medidas preventivas para COVID-19, vacuna antineumocócica, vacuna antigripal, casos o sospechas, resultados de hisopados, entre otras.

Conclusión: el auge de las tecnologías de la comunicación e información durante la pandemia permitió dar continuidad a los procesos asistenciales en salud pese al distanciamiento físico. Hubo mayor utilización de mensajería por necesidades informativas de los pacientes, y la relación médico-paciente se ha modificado.

Palabras clave: consulta remota, teleconsulta, telemedicina, e-accesibilidad, atención primaria de salud, Argentina.

INTRODUCTION

Context and Rationale

People (patients) can access personalized information about their health and that of their family members (subject to approval and or consent) through the Health Portal, which forms part of the Electronic Health Record (EHR). This functionality sets up a patient-physician communication channel through an institutional and formal framework, in which messaging facilitates free access to an asynchronous and non-urgent dialogue².

While information and communication technologies (ICT) have been around for some time, they have taken on unexpected relevance during the COVID-19 pandemic due to the accelerated adoption of digital technology. During the mandatory preventive social isolation (ASPO, *Aislamiento Social Preventivo y Obligatorio*) in Argentina, all programmed in-person appointments were abruptly suspended, and agendas shifted to synchronous teleconsultations. As a result, patients and physicians alike became exposed to a system that suddenly changed the rules, requiring forced adaptation⁷.

Objectives

In this context, our main objective was to compare the interaction and communication between general practitioners and patients before and during the pandemic, taking into account scheduled outpatient consultations (face-to-face and virtual) and messages through the Health Portal.

As secondary objectives, we explored the characteristics of the people who used these services, the most frequent content of the messages, and some specific terms used in them.

MATERIALS AND METHODS

Study design

We conducted a cross-sectional study at the Hospital Italiano de Buenos Aires (HIBA), a private high-complexity hospital in Buenos Aires, Argentina.

Context and participants

It included a consecutive sampling of scheduled outpatient appointments (face-to-face and virtual)

and messages occurring among 147 physicians of the Family and Community Medicine Service (FCMS) and a portfolio (capita) of 73,427 people affiliated with a prepaid institution (Health Plan).

The intra-pandemic period was defined as the time frame between epidemiological weeks (EW) 10 to 23 of 2020 (between 01/03/2020 and 6/06/2020 inclusive), and its historical control (pre-pandemic), defined as the same EW of the previous year (between 03/03/2019 and 8/06/2019).

Data sources

We used anonymous secondary data requested from the Information Management of the Research Department. Sources used were the administrative databases related to appointment scheduling, the Health Portal, and the Electronic Health Record (EHR).

Variables

The variables related to scheduled outpatient appointments were as follows: baseline characteristics of user-patients (age, gender) and administrative data related to the appointment: date-time of the request, method through which the reservation became effective, date and time of the appointment, type (in-person or virtual), physical location of the appointment, status of the appointment (absent, present), and the physician. The variables related to messages comprised socio-demographic characteristics of the sender (age and gender), date-time of reception, message content (free text field), intended recipient (corresponding healthcare provider), and date-time of response.

Statistical Methods

For descriptive analysis, continuous variables appear as mean and standard deviation (SD) in the case of a normal distribution or as median and interquartile range (IQR) if the distribution is abnormal. Categorical and ordinal variables appear as absolute and relative frequencies with their respective 95% confidence intervals (CI 95%). Additionally (for the analysis of message content), the count of specific terms (vaccine, flu, and pneumococcal), expressed as percentages of occurrence, and the most frequent words are reported through visual representation of a word cloud.

Ethical Considerations

The protocol of this study was approved by the Institutional Ethics Committee (CEPI#5641) and conducted under the guidelines outlined in the modified Helsinki Declaration. Informed consent was not required, and confidentiality was guaranteed, respecting the National Law on Personal Data Protection 25326/00.

RESULTS

Scheduled outpatient appointments

Between Weeks 10 and 23 of the year 2020, there was a decrease in in-person appointments, with an overall reduction of 70% (76,375 outpatient appointments in 2019 and 23,200 in 2020). As shown in Figure 1, this decline started abruptly in Week 12.

These scheduled outpatient appointments correspond to 33,391 patients in 2019 and 13,149 patients in 2020, representing 28.93% and 17.90% of the total per capita, respectively (75,253 in 2019 and 73,427 in 2020). The

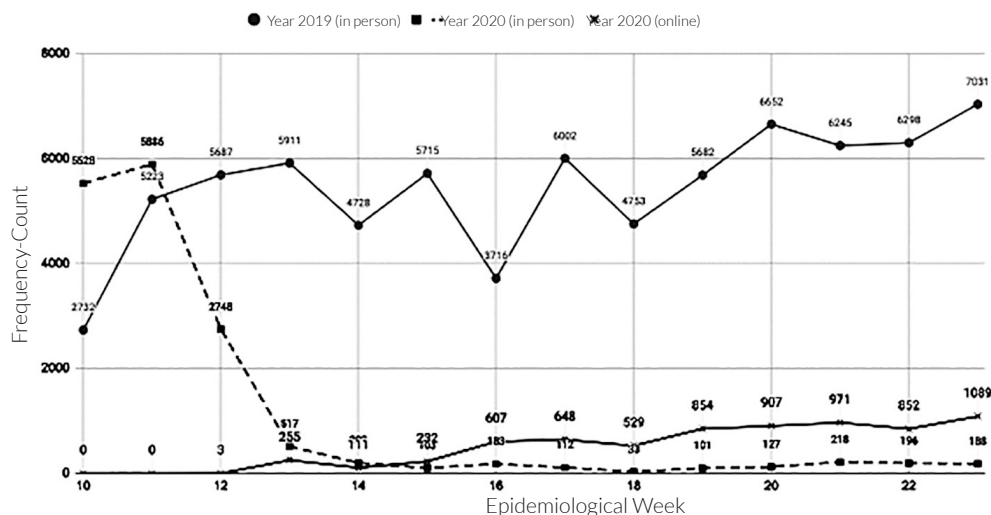


Figure 1. FMCH (Family Medicine and Community Health) scheduled outpatient consultations (2019 vs. 2020).

characteristics of these patients were: an average age of 64 years (IQR 27) and 65.21% (21,775) female in the year 2019 while an average age of 63 years (IQR 26) and 64.88% (8,531) female in the year 2020.

Simultaneously, there was a progressive increase in teleconsultations that allowed for complementing the provision of medical care in the absence of in-person visits, with a weekly frequency of 255 in EW13, escalating exponentially to reach its peak in EW23 with a weekly count of 1,389. While Information and Communication Technologies (ICT) only accounted for 30% of the total outpatient care during the overall analyzed period of the year 2020 (7,058 out of 23,200), when restricting the analysis to the period of Social Distancing and Preventive Measures (EW13-EW23), there were a total of 9,035 consultations, where they represented 78.08% (7,055).

Frequency-Count

Regarding data related to the type of appointment reservation, in 2019, 67% were in-person reservations, while in 2020, non-personal web and or EHR reservations gained significance with a frequency of 52%.

Health Portal Messages

There was a total of 84,916 messages from patients in 2020, compared to 28,601 in 2019. As seen in Figure 2, there was a sudden increase between EW11 and EW18, followed by stability with minimal year-to-year variation.

The promptness in responding remained with an average of 29.11 hours (SD 36.04) in 2019 and an average of 21.43 hours (SD 33.22) in 2020.

The messengers correspond to 11,434 patients in 2019, with an average age of 54 years, and 21,521 patients in 2020,

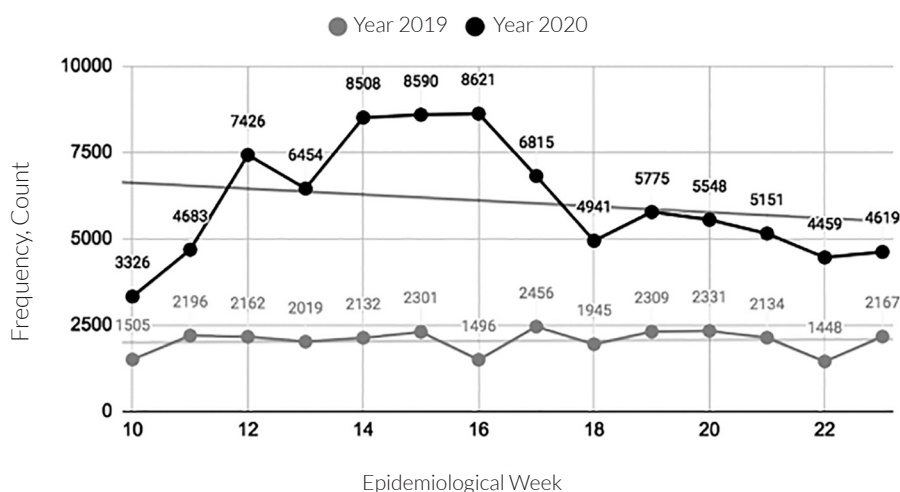


Figure 2. Messages from the Family and Community Medical Service (FCMS) Health Portal (2019 vs. 2020).

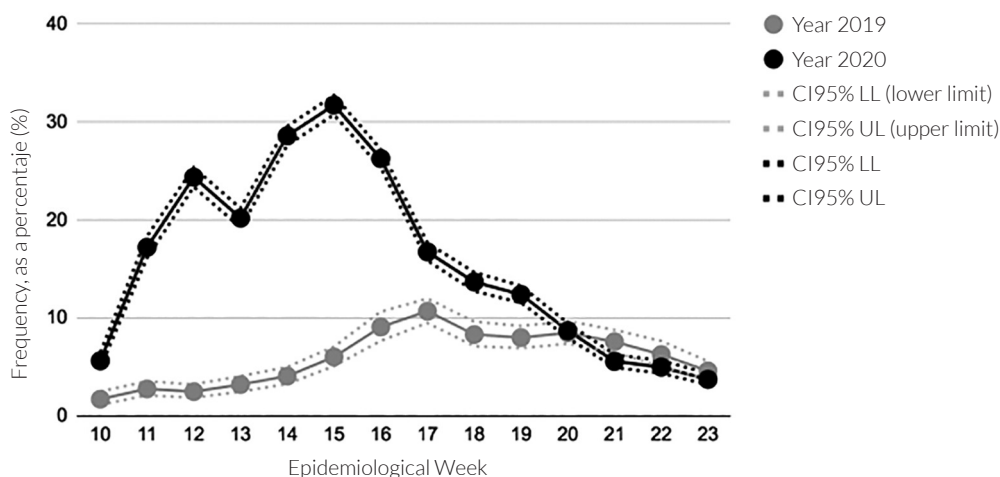


Figure 3. Vaccine term in messaging (2019 vs. 2020)

with an average age of 59 years, representing only 15% and 29% of the total capita. A significant increase in the age of patients from 54 to 60 years was observed ($p=0.001$).

Quantitative analysis of message content

The percentage of “vaccine” terms in the message content increased in 2020 compared to 2019 (Fig. 3), reaching a peak in EW15 at 32% during the intra-pandemic period. The maximum value for the term “anti-flu” was 21% in EW15, with a pronounced peak between EW11-EW16 in 2020 and significant differences compared to the historical control ($p < 0.001$). The maximum value for the term “pneumococcal” was observed in EW12 at 13%, with a marked peak between EW12 and EW16 in 2020, showing statistical significance compared to 2019 ($p < 0.001$).

Qualitative analysis of message content

Encoding patients’ vaccine-related informational needs derived the following dimensions: criteria for indication, order/prescription, adverse events, and administrative queries. Table 1 shows the specific categories for each domain.

Las palabras más frecuentes de la mensajería durante 2019 se muestran en la figura 4, donde se observan las necesidades informativas relacionadas

con el seguimiento del paciente a distancia (ejemplos: solicitud de turno o sobretorno debido a demora en la turnera clásica), diagnóstico (orden electrónica de estudios complementarios de sangre u orina), pronóstico/seguimiento (resultados de estudios o prácticas), y/o terapéuticas (vacuna, renovación de recetas crónicas, prescripción de medicamentos agudos, derivación o interconsulta a especialistas).

However, the most frequent words in messaging during 2020 revealed an empowerment of the pandemic: new terms emerged, such as vaccine, flu, pneumonia, prescription, electronic order, pharmacy, medications, in-person appointments, and requests for certificates or statements.

DISCUSSION

Key findings

Our main findings are a 70% reduction in scheduled face-to-face appointments compared to the previous year and a threefold increase in incoming messages from patients with no delay in response from primary care physicians.

Interpretation

This consistent promptness can probably be due to the reduced number of in-person working days for professionals and the high number of virtual

Table 1. Informational Needs of Patients

Dimensions and categories		Information needs
Physician	Criteria for indications	age
Physician		Risk factors
		Comorbidities
		Preexisting conditions
		Pregnancy
Physician		Scheme
		Interval
		Boosters
		serotypes
Physician	Adverse effects	
Physician	Indication request	Medicrdera
		Electronic prescription
Administrative	Availability	Paper prescription
		Stock
		Extra-HIBA options
		appointments
Administrative	Vaccination center	Price/copayment
		Centers
		Schedules
		Telephones
		Contact channels

HIBA: Hospital Italiano de Buenos Aires



appointments with patients absent. The latter may have resulted from the lack of communication with the patient about migrating agendas to teleconsultations or a lack of training in this new modality, especially faced with a population with many elderly individuals facing technical difficulties. These results demonstrate the impact of the pandemic on primary health care (PHC) during the first wave, aligning with what other healthcare systems have described⁸. Similar studies have reported reduced scheduled outpatient clinical care due to physical distancing measures⁹, and our findings reflect that sharp decline starting in EW12, coinciding with the National Social, Preventive, and Mandatory Isolation (NSPMI) decree issued on 20/03/2020. Concurrently, there was a surge in teleconsultations, with unprecedented growth despite pre-existing implementation barriers in the outpatient setting and the willingness of organizations to adopt this mode of service delivery¹⁰.

As a result, the pandemic has radically transformed clinical healthcare, and Primary Health Care (PHC) has undergone a mandatory reorganization from structural, logistical, and functional perspectives¹².

In this context, the swift adoption of telehealth was tripartite, involving patients, physicians, and Health Information Systems⁷. From the patients' perspective, there was an increase in new users registered on the Health Portal despite its existence for years, and a shift in their age (average from 54 years to 60 years; $p = 0.001$), potentially narrowing the digital divide. Older adults were the most vulnerable to falling behind¹³, a phenomenon that reflects our average age. While many are willing and able to learn, it could prove challenging with restricted visits or a lack of resources. From the perspective of healthcare professionals, the practice has been widely accepted in a short period¹⁴, allowing the preservation of a person-centered longitudinal approach

and or addressing informational needs, keeping those with higher complexity or risk in their homes and away from the healthcare system¹⁵. From the system perspective, our organization rapidly implemented telemedicine services^{16,17}, but likely without standard change management strategies and required training due to the immediacy of the phenomenon¹⁸.

Limitations

It is worth mentioning some limitations of our study. Firstly, it is a single-center study, which inherently limits the generalization per se of our observations. In this regard, the institution had previous experiences in telemedicine¹⁹, with integrated systems through the Electronic Health Record (EHR), ensuring the availability of contextual clinical information and the preexistence of the Personal Health Portal for doctor-patient communication¹. Secondly, the study's temporal window has implications for interpreting the findings, as the data correspond to the first wave in Argentina, where stringent health policies predominated and were gradually relaxed in response to the epidemiological evolution. Thirdly, this is a retrospective analysis of secondary data, and - although it would have been interesting to measure other variables of interest related to physician-patient care in PHC (examples: what types of consultations predominated, what sort of response they received, how they managed to adapt medical judgment to this new context, what professional strategies they developed) - this was not feasible and remains to be addressed. Fourthly, to comprehend the health impact of this shift (from in-person to virtual), it would have been interesting to have indicators of how the quality of healthcare was affected, from the perspective of the patient's perceived care, which undoubtedly would be an interesting point to investigate. However, this was also not feasible.

Generability and future directions

The pandemic was supposed to usher in the future of medicine,²⁰ allowing people to see their CM with a few clicks and from the comfort of their homes. However, our findings evidence that the boom in teleconsultations quickly plateaued and then faded in the face of the reopening of face-to-face visits, exposing some of the long-standing problems that inhibited the growth of the technology²¹. On the other hand, enrollees may appreciate the human factor of face-to-face consultations with their CMs. While some older adults were reluctant to leave the house (for fear of contagion) and continued to use teleconsultation, others quickly chose to return to personal contact, which removes geographic and time barriers. An interesting question will undoubtedly be to explore these linkage issues from the patient's perspective.

In conclusion, despite the sudden surge in telehealth, it will take more time to define a permanent role for this technology, and this new care model and an enhanced technical infrastructure are required to enable teleconsultation to become a daily routine²². New studies will be necessary to explore the patients' subjective perception of this emerging mode of care.

Conflicts of interests: the authors declare no conflicts of interests.

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