Digital Personalized Health and Medicine
L.B. Pape-Haugaard et al. (Eds.)

doi:10.3233/SHTI200266

Teletriage Pilot Study (Strategy for Unscheduled Teleconsultations): Results, Patient Acceptance and Satisfaction

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Abstract. Non-urgent consultations to an Emergency Department (ED) contribute to overcrowding. Telecommunications represent a potential strategy to reduce some face-to-face consultations. Objectives: To describe characteristics of patients who used the Teletriage Program during the pilot study, to explore safety and to report user acceptance and satisfaction. Methods: Cross-sectional study, including all adult patients affiliated to our health insurance attended to via this telemedicine service between January 18th and May 31st, 2019 (during pilot-study). Patients were followed-up for seven days to assess re-consultation to ED or unscheduled hospitalization. Results: 276 effective consultations occurred, corresponding to 241 patients, with a mean of age of 50 years, 68% (189) were women. Chief complaints were related to clinical issues (70%) and remaining (30%) were administrative problems. Only four patients were suggested a referral or face-to-face assessment. Rate of re-consultation to the ED was 18% (51) at seven days of follow-up, and the rate of unscheduled hospitalization was <1% (2), both with good clinical evolution. Patient satisfaction was 72.73%, and regarding acceptability, 66.12% stated that without this channel they would have attended to a face-to-face consultation and 64.02% that they would do so if their needs remained unmet. Conclusions: Implementing this new communication channel could be a useful and safe strategy to reduce unnecessary non-urgent consultations to the ED.

Keywords. eHealth, mHealth, teletriage, telehealth, telemedicine

1. Introduction

Non-urgent consultations to the Emergency Department (ED) contribute to a phenomenon known as overcrowding [1]. Evidence suggests that telemedicine plays an important role in evaluating patients that would otherwise attend to the ED. On the one hand, support by remote pre-hospital electrocardiogram for patients with suspected acute cardiovascular disease proved to avoid unnecessary hospitalizations and to confirm correct diagnoses, by-passing delays in the ED and therefore lowering mortality and costs [2–4]. Furthermore, the use of a telemedicine consultation program significantly decreased neuro-emergent stroke patient transfers from rural hospitals to

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urban settings, while increasing stroke specialist reading of patient imaging studies within 3 hours of the onset of stroke symptoms [5]. This experiences, as well as previous evidence on the use of telecommunications as a strategy to reduce non-urgent consultations to the ED [6], have reported reducing costs through a safe intervention [7], with elevated acceptance by users [8].

Our institution implemented a virtual program for low complexity respiratory teleconsultations during the epidemiological outbreak of Influenza in 2018, which proved to be a safe and effective strategy [9]. In that project, we perceived unmet clinical and administrative needs, which prompted us to implement a broader program for mild symptoms and non-urgent clinical consultations for adult patients.

The objective of this article is to describe the characteristics of patients who used this service during the pilot study, as well as to explore patient acceptance and satisfaction with the use of this tool.

2. Methods

Observational, descriptive, cross-sectional study at Hospital Italiano de Buenos Aires, a high-complexity hospital located in Buenos Aires, Argentina, that has its health insurance called Plan de Salud (PS) with over 150,000 affiliates. Our average daily rate of consultations to the ED is 500, 50% of which are attended to at a low complexity walk-in area with an admission rate below 1%.

Teletriage program was implemented and made available during the pilot period, on business days between 4 P.M., and 8 P.M. Consultations were initiated by patients through their Personal Health Records (PHR) via desktop or mobile devices, and attended to and registered by physicians in the EHR, with a structured form designed ad hoc. Variables in this form were used as secondary databases for the retrospective data collection.

We included all adult patients affiliated to PS who performed a teleconsultation between January 18th and May 31st, 2019. We excluded all teleconsultations with failure to communicate (initiated but not answered), non-effective consultations (failure with video, audio or chat, or with interruptions to the communication that could not be by-passed through an effective phone-call) or those with no complete structured form in the HER. Patients were followed-up for seven days from the date of teleconsultation to assess re-consultations to the ED and hospitalization.

Additionally, we evaluated waiting times (measured as the difference between the moment that the patient checks in and the moment in which the physician initiates the communication), patients' acceptance of the tool (through two mandatory questions to users before teleconsultation) and patients' satisfaction (measured through Telehealth Usability Questionnaire -TUQ- adapted from English [10]).

Mandatory questions with multiple-choice options were: (1) If this communication channel did not exist, what would you do? (A- Attend to a face-to-face consultation: walk-in clinic, ED; B- I would not carry out any consultation; C- Solicit an appointment with a physician; D- Use another Telemedicine system) and (2) If you could not solve your chief complaint through this teleconsultation system, what would you do to solve it? (A- Attend to a walk-in-clinic or ED, B- I would not carry out any consultations, C- Solicit an appointment with a physician).

Quantitative variables are presented according to distribution as means and standard deviation (SD), or median and interquartile range (IQR) or 25-75 percentiles.

Categorical variables are presented as absolute frequency and relative frequency (percentage). Rates are presented as prevalence, with its 95% confidence interval.

This research project was approved by the institutional review board. Confidentiality was guaranteed. There were no potential risks for patients.

3. Results

There were 476 virtual consultations registered. After applying exclusion criteria, we had a total of 276 effective consultations with a complete structured form, pertaining to 241 patients (see **Figure 1**).

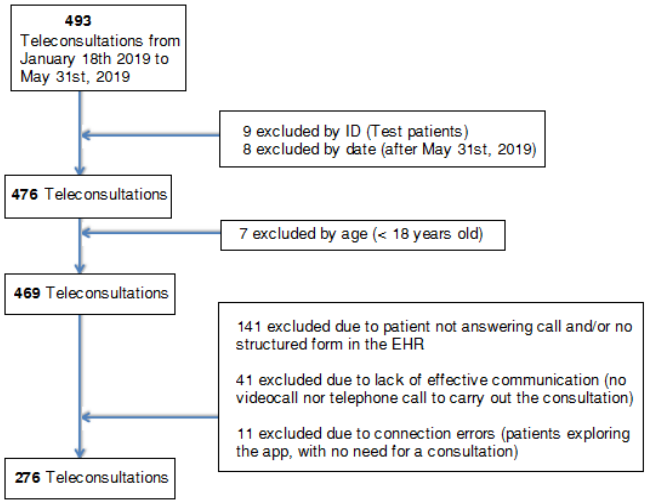

Figure 1– Flow chart of included patients

Service was offered for 90 days during the study period. Patients had a mean age of 50.46 years (SD 19.45), including patients from 18 to 97 years old, and 68.47% (189) were women. Data of care process was registered in EHR. Majority of chief complaints were clinical issues (detailed in **Table 1**) and solved through this channel. Administrative cases were related to drugs prescriptions or information, appointments, vaccines prescription, test results and medical information.

Table 1. Consultations and patient attention process

Chief complaint	n: 276
Administrative	29.34% (81)
Clinical	70.66% (194)
Respiratory	18.11% (50)
Infectious	17.75% (49)
Pain	13.76% (38)
Gastrointestinal	13.40% (37)
Gynaecological	3.98% (11)

Cardiological	2.89% (8)
Mental Health	0.77% (2)
Referral (ED, walk-in centre, doctor home visit)	1.44% (4)

The physician suggested a referral for a face-to-face assessment for only four patients (1.44%). At the seventh day of follow-up, the rate of re-consultation to ED was 18.47% (51), and the rate of unscheduled hospitalization was 0.72% (2), due to an asthmatic crisis and dehydration respectively. One patient had been referred to the ED while the other was already on her way to ED (during teleconsultation was carried out). Both had good clinical evolution.

In terms of waiting times, we found a median of 4 minutes (RIQ 9) and a mean of 7 minutes (SD 7.16).

As to patients' acceptance of this communication channel, 667 patients answered the mandatory questions (some never effectively checked in for a teleconsultation, and others experienced technical difficulties). 66.12% stated that without this channel, they would have attended to a face-to-face consultation and 64.02% that they would do so if their needs were not met with Telemedicine.

Regarding satisfaction assessment, 110 patients answered the TUQ (response rate of 23.45%). The percentage of patients that agreed 7/7 with the statements of the questionnaire were as follows: 'I am satisfied with the use of the system' (72.73%), 'I would use it again' (76.36%), 'Telemedicine is an acceptable way of receiving provision of healthcare' (73.64%), 'Teleconsultations are equivalent to face-to-face consultations' (28.18%), 'I am comfortable communicating with the physician via the Telemedicine system' (74.54%), 'I could see the physician as if I saw him in person' (52.73%), 'I could hear the physician when using the system' (57.27%) and 'I would recommend the Telemedicine system of HIBA to other people' (74.55%).

4. Discussion

This pilot study shows that implementation of an unscheduled teleconsultation program was a useful and safe strategy to meet patients' needs, representing an innovative and feasible experience for our institution, in compliance with recent suggestions by our Health Ministry for the development of Telemedicine in Argentina.

Additionally, based on emerging legal and moral consensus on hospitals' obligations towards its surrounding communities, Emergency Departments should not be treated as mere sources of admissions [11]. Therefore, management strategies such as this one are needed in order to improve the functioning of a collapsed system.

In consistence with our previous work, many chief complaints were administrative [9], which could be due to delays in patient attention in the outpatient setting. Our pilot also showed a high rate of satisfaction and acceptability. The lower percentages in patient satisfaction regarding how users saw and heard physicians were in line with the technical difficulties some patients experienced. This is mainly due to poor home Internet connections, which are highly prevalent in our country.

Lessons learned throughout this project will fuel improvements needed before implementing it at a larger scale. In consistency with evidence in the literature, we detected most usability issues in the initial phase of implementation of the telemedicine

system [12]. These issues prompted us to carry out a redesign of the tool and the process at the end of the pilot, with results that will be reported in the near future.

There are certain limitations to our study that need to be addressed. Real re-consultation rates can be underestimated since we did not take into account consultations to peripheral walk-in clinics that are part of our institution because we were unable to collect such information retrospectively. The analysis was also affected by effective teleconsultations not registered in the structured form in the EHR, due to the elevated number of physicians assigned to this project (higher possibility of errors in the process). The TUQ response rate was 23.45%, which could suggest a potential information or response bias, a denominator of self-selection or volunteer effect that has been reported in the literature [13], and it was adapted from English but not validated [14].

In accordance with the literature [15], we believe that part of our success was due to the existence of a local framework and the involvement of an interdisciplinary team, the activity of institutional communication channels, and the support provided by the Health Informatics Department, which allowed us to prioritize the caregiving process, maintaining efficacy of the workflow and improving providers' trust on the project.

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