Critical adjustments in a department of orthopedics through the COVID-19 pandemic

Gonzalo Luengo-Alonso
Department of Orthopedic Surgery and Traumatology. Hospital Universitario Fundación Jiménez Díaz. IIS Fundación Jiménez Díaz, Universidad Autónoma, Madrid, Spain https://orcid.org/0000-0003-3516-5043

Fernando García-Seisdedos Pérez-Tabernero
Department of Orthopedic Surgery and Traumatology. Hospital Universitario Fundación Jiménez Díaz. IIS Fundación Jiménez Díaz, Universidad Autónoma, Madrid, Spain https://orcid.org/0000-0001-5944-3533

Miguel Tovar Bazaga
Department of Orthopedic Surgery and Traumatology. Hospital Universitario Fundación Jiménez Díaz. IIS Fundación Jiménez Díaz, Universidad Autónoma, Madrid, Spain https://orcid.org/0000-0001-7072-7537

José M Arguello-Cuenca
Department of Orthopedic Surgery and Traumatology. Hospital Universitario Fundación Jiménez Díaz. IIS Fundación Jiménez Díaz, Universidad Autónoma, Madrid, Spain https://orcid.org/0000-0002-6920-0858

Emilio Calvo (ecalvo@fjd.es)
Department of Orthopedic Surgery and Traumatology. Hospital Universitario Fundación Jiménez Díaz. IIS Fundación Jiménez Díaz, Universidad Autónoma, Madrid, Spain https://orcid.org/0000-0002-6054-6078

Research Article

Keywords: SARS-CoV-2, COVID-19, telemedicine pandemic, orthopedic and trauma, surgery.

Posted Date: May 29th, 2020

DOI: https://doi.org/10.21203/rs.3.rs-31861/v1

Abstract

Purpose:

SARS-CoV-2 new scenario has forced health systems to work under extreme stress urging to perform a complete reorganization of the way our means and activities were organized. Orthopedic and trauma have rescheduled their activities to help SARS-CoV-2 units, but trauma patients require also treatment, and no standardized protocols have been established.

Methods:

Single-center cross-sectional study was performed in a tertiary hospital. Two different periods of time were analyzed: a two-week period time in March 2019 (pre-SARS-CoV-2) and the same period of March 2020 (SARS-CoV-2 pandemic time). Outpatient's data, emergency activity, surgical procedures and admissions were evaluated. Surgeons and patient´s opinion was also evaluated using a survey.

Results:

A total of ~16k (15.953) patients were evaluated. Scheduled clinical appointments decreased by ~22%. Urgent consultations and discharge from clinics also descended (~37% and ~20% respectively). Telemedicine was used in 90% of outpatient clinical evaluations. No elective surgical procedures during SARS-CoV-2 time were scheduled, and subtracting the effect of elective surgeries, a reduction of inpatient surgeries, from ~85% to ~59%. Patients delayed trauma assistance more than 48 hours in 13 cases (35%). Preoperative admission for hip fractures decreased in 10 hours on average. Finally surveys stated that patients were more in favor than surgeons to this new way to evaluate orthopedic and trauma patients based strongly on telemedicine.

Conclusion

Detailed protocols should be standardized for surgical departments during the pandemic. This paper offers a general view in how this virus affects an orthopedic unit and could serve as a protocol and example for orthopedic and trauma units. Even in the worst scenario, an orthopedic and Trauma unit could offer an effective, efficient and quality service. SARS-CoV-2 will set up a new paradigm for health care in orthopedics and trauma.

Introduction

The pandemic caused by the previously unknown SARS-CoV-2 (2019-nCoV, COVID-19) virus, was first detected in Wuhan, China [1-3]. This new scenario has forced health systems to work under extreme stress, using limited resources and put through a quick and complete reorganization of the way our means and activities were organized [4-6].

High mortality rates and intensive care unit (ICU) patients have been a challenge to every single health system [7]. Incidence of infected population and mortality are updated daily by the World Health Organization. To date, a total of 231 countries have reported cases, with a number close to ~1.6 million confirmed diagnosis, and almost ~100k deaths in all over the world [8]. Spain was one of the first countries after China to be hit with this epidemic, with its capital, Madrid, being the hardest hit region. Spain has seen a total of ~220k SARS-CoV-2 cases (3.6k per million people), with ~20k deaths (374 per million) [9].

Global experience covering how to adapt existing health systems to this new scenario is really limited. Few publications have reported alternative methodologies to adapt the operations and processes of a surgical department to this devastating scenario [10-11]. SARS-CoV-2 has required orthopedics and traumatology departments to reschedule daily activities, despite not being in the front-line fighting this virus. Our orthopedic and trauma activity had to be modified dramatically in order to collaborate directly with ICU and other medical units, to support the daily care of patients with 2019-nCoV disease and to provide our best health care delivery in a new scenario where the Spanish government set strict confinement measures.

While there has been a shift in Orthopedics and Traumatology departments' capacity towards SARS-CoV-2, the team has continued to serve patients requiring urgent care. Procedures such as trauma, tumors, and surgical complications (infections), were performed even during epidemic time. This exceptional situation obliged us to develop new protocols to preserve the safety of both patients and orthopedic surgeons [12-14].

The aim of our study is to share our experience and new strategies in the SARS-CoV-2 epidemics. This report provides great insight and useful and actionable learning to help orthopedic and trauma departments adapt to an epidemic such as SARS-CoV-2 in in an efficient way.

Our hypotheses are: (1) Patients evaluated in clinics and emergency room (ER) will decrease due to the lockdown associated to the pandemics, (2) discharges from consultation in orthopedic and trauma units will increase as result of patient´s fear to SARS-CoV-2, and (3) the number of surgical procedures will decline, but the average inhospital stay of patients undergoing emergent surgery will decrease.

Materials And Methods

Study design

Single-center cross-sectional study (observational, non-randomized at a specific point in time) was performed in two different periods of time: pre-epidemic (pre-SARS-COV-2), and intra-epidemic (during SARS-COV-2 time) to compare these two very different scenarios. The subjects that inform the study were consultant orthopedic surgeons and orthopedic and trauma patients treated at our hospital in our various areas: outpatients, inpatients, ER and operating room.

Inclusion/Exclusion Criteria

Inclusion criteria: Orthopedic and trauma patients evaluated and treated by our service staff during a period of two weeks in two different points in time, pre-epidemic and intra-epidemic.

Exclusion criteria: We excluded patients 18 years old and younger as pediatric health care was centralized in two centers in Madrid during the intra-epidemic period.

Study development and groups

Patients were divided into two groups. The first one includes patients evaluated and treated during the third and fourth week of March 2019 (pre-epidemic). The second group includes patients evaluated and treated during the third and fourth week of March 2020 (intra-epidemic).

Data Analyzed

Data used in this study was collected anonymously from our hospital database. We analyzed the following variables in both groups:

A) Outpatients data

Gathered data related to the number of patients evaluated in-person and telematically, either through phone call or real-time videoconferences, main reason for consulting, and subsequent appointments resulting from the visit were recorded regarding the following variables: overall number of patients evaluated due to orthopedic or trauma pathology, main reason for consulting, number of specific subspecialty appointments (ie, shoulder/elbow, hand/microsurgery, hip, knee, foot/ankle, spine and general trauma) drawn from these evaluations, and categorized as urgent or standard appointments, and number of discharged patients from clinics.

B) Emergency room

Overall ER department attendance, time elapsed from injury and specific complaint classified as hand, shoulder/elbow, hip and other lower extremity as well as specific injury was recorded.

C) Surgical procedures

Number, type of procedures, average inhospital stay, and inpatient/outpatient ratio was assessed. Surgical procedures were allocated into four categories: trauma, infection, tumors and non-trauma/elective surgery.

D) Inpatients and outpatients.

The surgical procedures performed were distributed into four categories: trauma, infection, tumors and non-trauma/elective surgery. We also looked at total and preoperative average stay for admitted patients.

Perceived Quality

Patient and surgeon´s perceived quality of medical care delivery was evaluated through this epidemic period using an anonymous survey carried out following a specifically designed questionnaire over the phone. Items were scored using a numerical rating scale (NRS) ranking 1 to 10. Patients and surgeons were also asked about their perception on the possibility that a similar system of telemedicine might be followed for future health care delivery in outpatient clinics (Table 1,2). Sixteen orthopedic surgeons and 300 patients were randomly selected for this purpose. A balanced number of subgroups including all anatomic areas were procured.

Quality appraisal

The quality of the study was assessed using STROBE system [15]. Out of 22 possible items we used 18 of the STROBE checklist for the methodological assessment (Table 3).

Statistical analysis

Relevant data was inserted into an electronic database (Microsoft® Excel for Windows® (Microsoft Corp, Redmond, WA)) for further analysis. Mean and standard deviation was used to describe quantitative variables, and frequency and percentage for qualitative variables. Data analysis was carried out using IBM SPSS version 24.0 (IBM SPSS, Armonk, NY, USA), and significance of pooled estimates was set at $p < 0.05$.

Institutional review board approval under act 07/20 was obtained prior to the commencement of the study and informed consent was obtained from all patients.

Results

A total of ~16k (15.953) patients from Group 1 (Pre- SARS-CoV-2) and Group 2 (SARS-CoV-2) were analyzed, following this distribution: 97,8% clinical consultations (15.607) and 2,2% surgical procedures (346) (Table 4).

Scheduled clinical consultations decreased severely by ~22%. General outpatient clinics attendances showed a relative decline of ~16%, but ER attendances experienced a dramatic reduction of ~37%. Discharge from outpatient clinics also decreased from 1331 to 837 in SARS-CoV-2 Group, which represents a relative reduction of ~20% (Table 5).

Drilling deeper into consultations, appointments scheduled from clinical consultation decreased in 759 consultations (~26%) when compared to Group 1. With regard to subspecialties, all showed a decrease which was more severe in hand/microsurgery (~12%) and spine (~73%), while knee consultations increased by ~27% (Table 6).

During SARS-CoV-2 epidemic less than 10% of outpatient clinical appointments were performed in-person, while the rest of them were done virtually.

Concerning surgical activity, the number of surgical procedures declined dramatically in the two-week period under analysis from 304 surgical cases in 2019 to 34 in 2020, representing an 88,8% drop-off. This decrease was heavily driven by elective surgeries that were not scheduled during the epidemic time were, whereas a total of 219 procedures were recorded in Group 1. Even after taking out elective surgeries from the sample, a large drop of ~60% in non-trauma/elective surgery could be detected, from 85 in Group 1 to 34 in Group 2. Also, subtracting the effect of elective surgeries, a reduction of inpatient surgeries, from ~85% to ~59% (a relative drop of ~31%), was observed trying to keep these patients away of the pandemic as soon as possible. Similarly, preoperative average in hospital stay for hip fractures in Group 1 was more than 30 hours compared to a mean time of 20 hours in Group 2. Mean admission time for hip fractures in Group 1 was 7 days and 7 hours (6 days postoperatively) compared to a mean time of 2 days mean and 1 day and 3 hours postoperatively, in Group 2 (Table 7). Trauma cases decreased more than 54% during epidemic time compared to the previous year demonstrating the effect of lockdown. Shoulder/elbow and hip fractures showed the biggest drops with ~68% and 57% declines respectively (Table 8).

Concerning urgent trauma, patients were reluctant to attend the ER. In pre-SARS-COV-2 patient´s delay was exceptional ~5%, opposite to what happened in SARS-COV-2 crisis, in which this percentage increased to ~35%. Some patients requested medical attention even later than a week (16,6%) suffering serious injuries (ie hip fractures) (Table 9).

In terms of satisfaction, surgeon´s perceived quality of medical care delivery reached an overall score of 6,6 points. As for the effectiveness of telemedicine clinical evaluations, surgeons believed that they could conduct up to ~25% virtually (Table 10). As for surgeon views, most of them ranked telemedicine as the preferred method during SARS-COV-2, even though a majority agreed a physical consultation would provide an additional value to telemedicine. In terms of remote consultation surgeon´s opinion was divided as to whether continuing with telemedicine or not after the pandemic (Table 10).

On the contrary, patients rated the new system for telematic health care delivery with higher scores both regarding the new consultation system, and the information received (Table 11). However, a vast majority of patients would have preferred a face-to-face interview, and only half of them would consider following the same system after the pandemic.

Discussion

SARS-CoV-2 stretched health systems all over the world [5,6,10,13] Since the first diagnosis in China nearly 2 million cases have been confirmed worldwide, 1 million of those in Europe. Within Europe, Spain is one of the countries with the highest number of confirmed cases, ~200k, and Madrid has been the hardest city hit, with ~51k cases up to date. Although experts and data are encouraging, pandemic continues rising, with nearly 400 deaths daily and a total of ~20k deaths in our country [9].

The fact that Madrid has been one of the first big European cities hit by the pandemic has allowed us to share with the orthopedic community our experience in managing orthopedic health care delivery in such difficult conditions. In this scenario we have contributed supporting those medical units directly involved in the treatment of patients affected by SARS-CoV-2, but we also continued providing healthcare to our patients. We have therefore applied a cross-sectional observational study, evaluating data from specific points in time, allowing us to compare our two very different scenarios, pre-SARS-CoV-2 vs SARS-CoV-2. Results from this type of studies are more generalizable to geographically defined populations, as in this case is redefining orthopedic activity in SARS-CoV-2 pandemic time. To our knowledge this is the first study reporting fast changes experienced by a large orthopedic department in an academic hospital as result of the SARS-CoV-2 pandemic, and several interesting conclusions can be drawn from this experience.

Attendance in all working areas (ER, surgery, consultation and admission) decreased as expected as consequence of SARS-CoV-2. Only patients requiring urgent care, such as trauma, tumors and infections have been scheduled as expected. Admissions were also affected, as procedures were performed on an outpatient basis whenever possible, but preoperative and overall average stay of those cases managed inpatient decreased dramatically. It is interesting to note that this finding was strongly influenced by management of hip fractures. Hip fracture is a common procedure that cannot be delayed, and has an important influence on the average in-hospital stay. Interestingly, average stay dropped sharply from 7 days in the same period of March 2019 to less than 2 days during the pandemic. This reduction was mostly due to a sharp minimization of postoperative stay. Even in-hospital admission time for a hip fracture was in many cases less than 24 hours long. This represents a new scenario, as we do not what will be the outcome of these fragile patients without postoperative orthogeriatric care. As for the long-term persistence of this shift from inpatient to outpatient treatments, it is hard to predict. We have noticed families played a key role in discharging patients as soon as possible due to the risk SARS-CoV-2 infection, but it is yet to demonstrate that that level of engagement and support will be sustained after the pandemic.

At the ER, a dramatic decrease (more than 90%) in patients requiring orthopedic evaluation was also observed. This decrease was driven by both the confinement measurements and by patients being afraid of SARS-CoV-2. It is important to point out that the majority of patients who attended the ER several days after the traumatic event, occurred probably due to fear of infection transmission of coronavirus, even in the case of hip fractures. Therefore, delayed treatment of trauma cases should be expected in countries affected by the pandemic.

Evaluation in outpatient clinics changed to telemedicine assistance in the vast majority of cases, maintaining in-person evaluation only for those cases in which physical evaluation or direct cast or wound care was deemed necessary. This has led to two unprecedented changes: a notable transformation in the doctor-patient relationship, and also a significant impact in surgeon’s practice. Accordingly surveys were performed to orthopedic surgeons and patients aimed to assess the perceived quality of this appraisal. Overall orthopedic surgeons satisfaction on the quality of health care delivered

reached fair result of 6,7 points. This critical SARS-CoV-2 period, and a radical change in our daily practice could be the main reasons for this results. Results from our surgeons are quite rational, as the majority considered that telemedicine was very helpful in this special setting. However, they did not agree when the possibility of continuing this telemedicine system for patient consultation after the pandemic. This is probably due to the fact that the majority of telemedicine consultations corresponded to follow up appointments of previously evaluated patients, but the system might have limitations for first clinical appointments. An interview differentiating first and follow up appointments should be performed to clarify this point. The experience reported in this study provides a new insight in outpatient's clinics health care delivery, and anticipate a new paradigm in the management of outpatient orthopedic clinics. With regard to patients satisfaction on the other hand, patients survey had better result with a mean of 8,3 points. Although we cannot rule out the potential bias in their answers given the critical situation of the lockdown, this score also proves that our patients are open minded in terms of adoption of new technologies for health care delivery in outpatient clinics.

This study has several strengths. First of all, it compares the same time period of the year in two completely different situations (pre- SARS-CoV-2 vs SARS-CoV-2); it studies an important patient series, and it assesses objective and subjective information from surgeons and patients with encouraging results. Some drawbacks should also be mentioned, as data drawn from the investigation cannot necessarily be extrapolated to a postpandemic scenario since patients and surgeons opinion could be biased by the exceptional SARS-CoV-2 pandemic.

In conclusion, this investigation provides data of an Orthopedic and Trauma Department in a tertiary-level downtown academic hospital at the epicentre of SARS-CoV-2 pandemic in Europe. Changes to highlight include a severe decrease in surgical activity, a reduction in ER attendance and delay, an increase of outpatient surgery rate, and the efficient role that new technologies and telemedicine can play in our practice. Even though the acute threat of SARS-CoV-2 will pass, things will not return completely as they were before and it is expected that this experience will set up a new paradigm for health care delivery in orthopedics and trauma.

Declarations

Acknowledgements: The authors wish to thank Jose María Luengo Alonso for his technical assistance in the analysis and editing the manuscript.

Conflict of Interest: We have no conflicts of interest to disclose.

Disclaimer: the authors did not receive any outside funding or grants in support of their research for or preparation of this work. No commercial entity paid or directed, or agreed to pay or direct, any benefits to any research fund, foundation, division, center, clinical practice, or other charitable or nonprofit organization with which the authors, or a member of their immediate families, are affiliated or associated, and there are no sources of support.

References

1. Zhu N, Zhang D, Wang W, Li X, Yang B, Song J, Zhao X, Huang B, Shi W, Lu R, Niu P, Zhan F, Ma X, Wang D, Xu W, Wu G, Gao GF, Tan W, (2020) China Novel Coronavirus Investigating and Research Team. A novel coronavirus from patients with pneumonia in China. N Engl J Med. 20;382(8):p.727-33.

2. Lu H, Stratton CW, Tang Y, (2020) Outbreak of pneumonia of unknown etiology in Wuhan, China: The mystery and the miracle. J Med Virol. 92(4):p.401-2. doi: 10.1002/jmv.25678.

3. Meo SA, Alhowikan AM, Al-Khlaiwi T (2020) Novel coronavirus 2019-nCoV: prevalence, biological and clinical characteristics comparison with SARS-CoV and MERS-CoV. Eur Rev Med Pharmacol Sci. 24(4):p.2012-9. Epub 2020/03/07.

4. Halawi MJ, Wang DD, Hunt TR. (2020) What's Important: Weathering the COVID-19 Crisis. J Bone Jt Surg. 102(9):p 759-60. doi: 10.2106/JBJS.20.00419.

5. Cao Y, Li Q, Chen J, Guo X, Miao C, Yang H (2020) Hospital Emergency Management Plan During the COVID-19 Epidemic. Acad Emerg Med. 27(4):p.309-11. doi: 10.1111/acem.13951.

6. Adalja AA, Toner E, Inglesby TV, (2020) Priorities for the US Health Community Responding to COVID-19. JAMA Mar 3. doi: 10.1001/jama.2020.3413.

7. Bhatraju PK, Ghassemieh BJ, Nichols M, Kim R, Jerome KR, Nalla AK, (2020) Covid-19 in Critically Ill Patients in the Seattle Region — Case Series. N Engl J 30;NEJMoa2004500. doi: 10.1056/NEJMoa2004500.
8. Who.int. (2020). Coronavirus. [online] Accessed 2020 April 20.Available at- https-www.who.intemergenciesdiseasesnovel-coronavirus-2019

9. Spanish National Ministry of Health: Accessed 2020 April 20. https://www.mscbs.gob.es/en/profesionales/saludPublica/ccayes/alertasActual/nCov-China/documentos/Actualizacion_82_COVID-19.pdf

10. Coccolini F, Perrone G, Chiarugi M, Di Marzo F, Ansaloni L, Scandroglio I, (2020) Surgery in COVID-19 patients: operational directives. World J Emerg Surg. 7;15(1):p.1-7.doi: 10.1186/s13017-020-00307-2

11. Ti LK, Ang LS, Foong TW, Ng BSW, (2020) What we do when a COVID-19 patient needs an operation: operating room preparation and guidance. Can J Anesth 6:p.1-3.doi: 10.1007/s12630-020-01617-4.
12. Iacobucci G, (2020) Covid-19: all non-urgent elective surgery is suspended for at least three months in England. BMJ. 18;368:p.1106. Epub 2020/03/20.

13. Chang Liang Z, Wang W, Murphy D, Po Hui JH, (2020) Novel Coronavirus and Orthopedic Surgery: Early Experiences from Singapore. J Bone Jt Surg. Mar 20:p.745-9 doi: 10.2106/JBJS.20.00236.

14. Mavrogenis AF, Quaile A, Scarlat MM. (2020) The virus crisis affects Orthopaedic surgery and scientific activities worldwide. Int Orthop Apr 11;44(5):p. 813-7. https://doi.org/10.1007/s00264-020-04557-2

15. Von Elm E, Altman DG, Egger M, (2007) The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement: guidelines for reporting observational studies. Lancet 370:p.1453–57. doi: 10.1016/S0140-6736(07)61602-X.

Tables

- Telematics Surveys to patients:

1. Rate telematics consultation from 0 to 10. 0 (very unsatisfied) – 10 (very satisfied) ( )
2. Rate information received from your surgeon 0 to 10. 0 (very unsatisfied) – 10 (very satisfied) ( )
3. Did your doctor dedicated enough time during your telematic consultation to evaluate your case?

   No ( ) Yes ( )

4. Are you satisfied with telematics evaluation?

   No ( ) Yes ( )

5. Would you prefer face-to-face evaluation?

   No ( ) Yes ( )

6. Do you think that telematic follow-up would be appropriate for some of your upcoming consultations?

   No ( ) Yes ( )

7. Would you prefer videoconference instead of phone calls?

   No ( ) Yes ( )

- Epidemiology data:

  - Male ( ) Age : 18-44 ( ) 45-64 ( ) >65 ( )

  - Female ( ) Age : 18-44 ( ) 45-64 ( ) >65 ( )

Table 1. Telematics Surveys to patients.

- Orthopedic Surgeon Survey

1. Rate consultation from 0 to 10. 0 (very unsatisfied) – 10 (very satisfied)

   ( )

2. Would you prefer a face-to-face evaluation?

   No ( ) Yes ( )

3. Do you think a face-to-face consultation would provide more information or change your medical attitude?

   No ( ) Yes ( )

4. From now on, do you think a telephone follow-up would be appropriate some of the upcoming evaluations?

   No ( ) Yes ( )

5. What percentage do you think you could evaluate using telemedicine without losing care quality?

   ( ) %

Table 2. Orthopedic Surgeon Survey.

ITEM	DESCRIPTION
Title and abstract (1)	(a) Indicate the study's design with a commonly used term in the title or the abstract (b) Provide in the abstract an informative and balanced summary of what was done and what was found
Introduction	
Background/rationale (2)	Explain the scientific background and rationale for the investigation being reported
Objectives (3)	State specific objectives, including any prespecified hypotheses
Methods	
Study design (4)	Present key elements of study design early in the paper
Setting (5)	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, and data collection
Participant (6)	Give the eligibility criteria, and the sources and methods of selection of participants.
Variables (7)	Clearly define all outcomes, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable
Data source /measurements (8)	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group.
Quantitative variables (11)	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why.
Statistical methods (12)	(a) Describe all statistical methods, explain how missing data were addressed if applicable (b) Describe any methods used to examine subgroups and interactions (c) Explain how missing data were addressed
Result	
Participants (13)	Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analyzed
Descriptive data (14)	Indicate number of participants with missing data for each variable of interest
Outcome data (15)	Report numbers of outcome events or summary measures over time.
Main results (16)	Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision
Discussion	
Key results (18)	Summarize key results with reference to study objectives
Limitations (19)	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias
Interpretation (20)	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence
Generalisability (21)	Discuss the generalizability (external validity) of the study results

TABLE 3 . STROBE item used

	Clinical Evaluation	Surgical procedures
Group 1	8760	304
Group 2	6847	42
Total	15607	346

Table 4. Group 1. Patients pre-SARS-CoV-2 (2019). Group 2. Patients SARS-CoV-2 (2020).

	Group 1 (pre- SARS-CoV-2)	Group 2 (SARS-CoV-2)
Total Clinical Appointments	8760	7831
Attendance	7831 (89,39%)	5134 (74,98%)
Urgent appointments	680 (7,76%)	334 (4,87%)
None-contact	929 (10,60%)	1713 (25,01%)
Discharges	1331 (15,19%)	837 (12,22%)

Table 5. Clinical appointments.

		Group 1 (pre-SARS-COV-2)	Group 2 (SARS-COV-2)
Foot and Ankle	Urgent	5	2
	Total	434	354
Knee	Urgent	18	1
	Total	509	478
Hip	Urgent	5	0
	Total	163	142
Spine	Urgent	45	9
	Total	720	530
Hand/Microsurgery	Urgent	29	2
	Total	545	358
Shoulder/Elbow	Urgent	12	5
	Total	464	309
TOTAL		2949	2190

Table 6. Appointments made in clinic consultation.

	Group 1 (pre-SARS-COV-2)		Group 2 (SARS-COV-2)	
	Outpatients	Inpatients	Outpatients	Inpatients
Elective	164	55	0	0
Trauma	7	10	14	2
Hip Fractures	0	28	0	12
Infection	0	11	0	1
Tumors	0	5	0	3
Spine	6	18	0	2
TOTAL	177	127	14	20

Table 7. Surgical Procedures Comparison

	Group 1 (pre-SARS-COV-2)	Group 2 (SARS-COV-2)
Hand/Microsurgery	14	8
Shoulder and Elbow	19	6
Lower Extremity	18	10
Hip Fractures	28	12
TOTAL	79	36

Table 8. Trauma cases attended

	Group 1 (pre-SARS-COV-2)	Group 2 (SARS-COV-2)
Less than 48 hours	75	23
More than 48 hours	3	7
More than 7 days	1	6
TOTAL	79	36

Table 9. ED Trauma cases

	Satisfaction (0-10)	Clinical evaluations that could be done telematically. (0-100%)
Knee	7,5	35%
Hip	8	30%
Shoulder / Elbow	7	25%
Spine	6,5	15%
Hand / Microsurgery	5	22,5%
Foot and ankle	6,5	22,5%
Trauma	6,5	12,5%

	YES	NO
2. Would you prefer a face-to-face evaluation?	81,25%	18,75%
3. Do you think a face-to-face consultation would provide more information or change your medical attitude?	87,5%	12,5%
4. From now on, do you think a telephone follow-up would be appropriate some of the upcoming evaluations?	37,5%	62,5%

Table 10. Survey results after interviewing 16 orthopedic surgeons.

	Mean	Standard Deviation	Range
Age	58,45	16,78	18-93 years
Telematic Evaluation	8,32	1,24	3-10 points
Information Received	8,01	1,57	1-10 points
Sex	Female (61,9%)		Male (38,1%)
	Yes		No
3. Did your doctor dedicated enough time during your telematics consultation to evaluate your case?	91,4%		8,6%
4. Are you satisfied with telematics evaluation?	63,8%		36,2%
5. Would you prefer face-to-face evaluation?	69%		31%
6. Do you think that telematics follow-up would be appropriate for some of your upcoming consultations?	49%		51%
7. Would you prefer videoconference instead of phone calls?	12,4%		87,6%

Table 11. Data obtained from Perceived Quality survey to patients.