

COVID-19 Pandemic Impact on Orthopaedic Trauma Practice: A Global Perspective

Abdallah S Al-Omran

Department of Orthopaedic Surgery, College of Medicine, Imam AbdulRahman Bin Faisal University Dammam and King Fahd Hospital of the University, AlKhobar, Saudi Arabia

Correspondence: Abdallah S Al-Omran, King Fahd Hospital of the University, POBox 40071, AlKhobar, 31952, Saudi Arabia, Email alomranabdallahs@gmail.com

Background and Objective: We conducted a systematic review to evaluate the global impact on orthopaedic trauma admissions during the COVID-19 crisis and compare it to that in Saudi Arabia.

Methods: We conducted an extensive search of the PubMed and the Cochrane Central Register of Clinical Trials databases for articles published on orthopaedic trauma during the pandemic. We used the terms “orthopaedic trauma”, “coronavirus”, “covid-19”, and “Sars-cov-2” for the search. We retrieved data to assess the impact of COVID-19 on orthopaedic and trauma patients attending hospitals during the pandemic. Secondary outcomes included reports from various regions of the world, differences in patient age, gender, and comparison to the nonlockdown period. We excluded questionnaires, surveys, reviews, and meta-analyses. The studies were divided based on where they were conducted: the Americas; the United Kingdom; Europe; Asia; the Middle East; and Australia, including New Zealand.

Results: We retrieved 763 studies using the keywords and initially analyzed 70. We chose 23 studies for final analysis, which were all retrospective studies, from which we extracted 50% of our preset data. These articles included 16,383 patients who sought advice related to orthopaedic and trauma necessities during the pandemic. Before the pandemic, 61,559 patients sought advice for orthopaedic and trauma necessities. Most of the reports focused on adults, and in three studies, researchers reported on paediatric on orthopaedic patients. The average decrease in patients seeking orthopaedic and trauma assistance during the pandemic was 45.5 ± 20.4 (range 18.9–86%, $p < 0.001$). The largest decrease in patients seeking advice occurred in Asia (>60%), and the lowest occurred in Australia and New Zealand (about 20%, $p < 0.001$).

Conclusion: Presentations of orthopaedic trauma during the COVID-19 during pandemic lockdown was less but not as profoundly as one may have expected.

Keywords: COVID-19, orthopaedics, traumatology, pandemic, SARS-cov-2

Introduction

Wuhan, China, was the origin of the worldwide spread of COVID-19.¹ The World Health Organization took the time to announce the COVID-19 pandemic was a public health emergency.^{2–4} The spread of the virus was quick and unabated. It took the medical community by surprise and caused immeasurable morbidity and mortality, particularly in patients with underlying comorbidities.^{5,6} COVID-19 was reported in 214 countries,⁷ and even with precautions, nations could not control the spread. Attempts to do so included lockdowns, closure of schools, and working from home in many countries, but many people still died.

The lockdowns affected many medical services, but people with emergencies still arrived at hospitals. Raman et al⁸ reported a negative impact on the entire health-care sector due to the lockdowns. The most affected were ambulatory practices, which declined nearly 60%. Primary care visits decreased between 49.0% and 101.8%.⁹ Specialist consultations were not immune to this drop. For example, gynaecological emergency admissions dropped by 50%¹⁰ and general surgery emergencies by 59.1%.¹¹ Orthopaedic and trauma consultations decreased across the board. Reports from various parts of the world presented varying figures irrespective of how severely the population was affected. The objective of this review is to evaluate the global impact on orthopaedic trauma admissions during

the COVID-19 crisis and compare it to that in Saudi Arabia so future decisions can be made to improve health-care delivery in pandemic situations.

Methods

We conducted an extensive search of PubMed and the Cochrane Central Register of Clinical Trials databases for articles published on orthopaedic trauma during the pandemic. We used the terms “orthopaedic trauma”, “coronavirus”, “COVID-19”, and “Sars-cov-2” for the search. We retrieved data to assess the impact of COVID-19 on orthopaedic and trauma patients attending hospitals during the pandemic. We placed no restrictions on the date of publication but only considered articles published in English. We excluded questionnaires, surveys, reviews, and meta-analyses. We selected articles for final analysis per the inclusion and exclusion criteria. Secondary data that we gathered included reports from various regions of the world, differences in patient age, gender, and comparison to the nonlockdown period. We divided the studies into six regions of origin: the Americas; the United Kingdom; Europe; Asia; the Middle East; and Australia, including New Zealand. We took the mean pooled numbers from each region for comparisons between the regions and the populations studied. The reduction in the number of orthopaedic and trauma consultations and admissions estimates of odds ratio (OR) (percentage and 95% CI). We set the level of significance at $p < 0.05$. We performed all statistical analyses using SPSS Inc., version 25. We conducted this review in line with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines¹² and graded articles we included in the final analysis using the Newcastle-Ottawa Scale for the Assessment of the Quality of nonrandomised studies in meta-analyses.¹³ Table 1 gives the 23 studies that were part of the analysis.

Results

We identified 763 published papers on the subject. We initially analyzed 70 studies, which we retrieved using the keywords related to orthopaedic and trauma necessities and chose 23 studies for final analysis. All of them were retrospective studies, from which we could extract 50% of our preset data. These articles included 16,383 patients who sought advice related to orthopaedics and trauma during the pandemic (Figure 1). Before the pandemic, 61,559 patients sought advice for orthopaedic and trauma necessities. Most of the reports focused on adults, and in three studies, researchers did report on pandemic on paediatric orthopaedic patients. Figure 2 shows the comparison between the patients seen during and prior to the pandemic. The average decrease in patients seeking orthopaedic and trauma care during the pandemic was 45.5 ± 20.4 (range 18.9–86%, $p < 0.001$). The largest decrease in patients seeking advice occurred in Asia (60%) and the lowest in Australia and New Zealand, at about 20% ($p < 0.001$). As Figure 3 shows, the least cited reports on orthopaedic practice occurred in the Middle East region, with a single report.

Discussion

This review shows that a global decrease occurred in consultations for orthopaedic and trauma patients during the COVID-19 pandemic and the resulting lockdown to control the infection's spread. The average decrease in patients seeking orthopaedic and trauma care during the pandemic was 45.5 ± 20.4 . It reached 86% in Asia¹⁴ and 82% in Europe.²² Wong et al retrieved data from 7.5 million residents during the lockdown and reported a decrease in more than 85%. Unlike in Asia, Hamill and Sawyer (2020) reported the lowest decrease in New Zealand (32.9%), with no motor vehicle accidents. We did not observe this trend in most of the countries. In our own experience in Saudi Arabia, motor vehicle accidents were reported as frequently as home accidents.

The overall decrease in the some studies reached 90%,³⁷ but researchers measured this steep decline by way of surveys to assess the importance of telemedicine.³⁸ This decrease could have occurred due to minor injuries, which would be dealt by the emergency room was taken care at home while people with serious injuries sought hospital care. During the lockdown, nonurgent traffic decreased, leading to fewer motor vehicle accidents in many European and Asian countries.^{15,33,36} In our centre, road traffic accidents decreased by more than 80%.²⁹ Also, sports-related trauma and injuries among children in playgrounds decreased due to the quarantine, as expected. However, injuries at home increased.^{19,32}

Table I Data Extracted from the Published Studies

Authors	Age Group (Years)	No of Patients in Pandemic	Prior Pandemic	Males %	Females %	Pediatrics	Emergency Trauma	Drop in Patients %
Wong & Cheung ¹⁴	NQ	3992	28,621	NQ	NQ	NQ	380	86
Dhillon et al ¹⁵	NQ	263	611	NQ	NQ	NQ	298	56.9
Reddy et al ¹⁶	NQ	754	2020	NQ	NQ	155	298	62.6
Yu et al ¹⁷	76.7	112	196	52	48	NQ	NQ	42.8
Probert et al ¹⁸	46.2	135	159	61	39	NQ	NQ	15
Hamill & Sawyer ¹⁹	<14	57	85	NQ	NQ	57	57	32.9
Raitio et al ²⁰	NQ	379	1376	63	37	NQ	379	72.45
Hernigou et al ²¹	45.5	152	NQ	NQ	NQ	28	140	32
Turgut et al ²²	40.3	2290	13,086	631	805	838	NQ	82.5
Maleitzke et al ²³	NQ	3743	5864	631	451	NQ	1822	30.1
Luceri et al ²⁴	41.2	670	2558	44.3	55.7	62	NQ	26.2
Staunton et al ²⁵	55	159	291	45	55	NQ	NQ	45.4
Mitkovic et al ²⁶	63.7	86	106	44	56	NQ	NQ	18.9
Zagra et al ²⁷	NQ	664	2172	NQ	NQ	NQ	NQ	69.4
Maniscalco et al ²⁸	81.1	121	169	NQ	NQ	NQ	NQ	32.2
Sadat-Ali et al ²⁹	37.3	71	110	54	8	9	71	35.4
Mackay et al ³⁰	46.3	166	NQ	93	73	NQ	100	NQ
Sugand ³¹	52.4	1183	1792	43.7	56.3	NQ	100	34
Sugand et al ³²	NQ	97	302	53	44	NQ	NQ	67.8
Park et al ³³	NQ	87	193	43	44	12	92	54.9
Murphy et al ³⁴	61	603	887			55	396	32
Greenhalgh et al ³⁵	NQ	265	537	NQ	NQ	NQ	NQ	50.7
Lubbe et al ³⁶	45	334	424	265	NQ	NQ	NQ	21.2

Abbreviation: NQ, not quoted.

The COVID19 outbreak undoubtedly reduced the number of patients seeking orthopaedic and trauma care, but at the same time, more patients presented with serious injuries later than normal at the hospital because they were afraid of infection with the SARS-2 virus. One condition was hip fractures in the elderly, which put patients at a greater risk of complications if they delayed presentation. Serra-Torres et al reported that during the pandemic, patients delayed presentation by 4.1 days after suffering fractures. Studies indicated that late presentation and delayed surgery increased complications and 30-day mortality.^{39,40} In our study, the length delay of presentation with hip fractures in the elderly was 7 days, and we encountered postoperative infection and no mortality. Our sample was too small for us to make a conclusion regarding this matter.

Orthopaedic trauma consultations and admissions were not the only service that decreased during the pandemic.⁴¹ The provision of other services, such as emergency room visits⁴² and neurosurgical procedures⁴³ also decreased. One study revealed a 63.3% reduction in operative volume among general surgery patients.⁴³ The literature indicates that

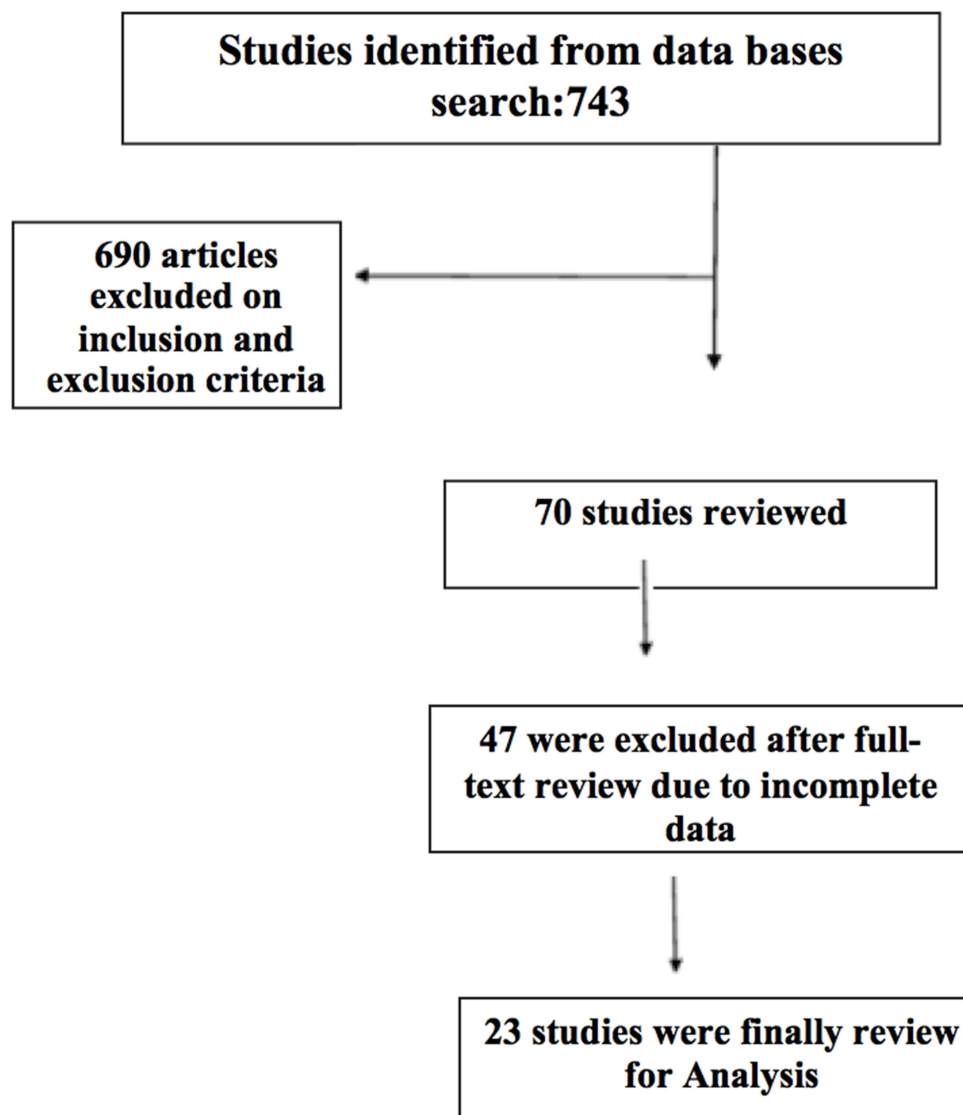


Figure 1 PRISMA flow chart of the review.

orthopaedic and trauma admissions and consultations were not the only service in which consultations and surgeries decreased by more than 50%.⁴⁴

This review has limitations, as we had to exclude many studies that did not provide sufficient data for inclusion in the analysis. This review's strength was that it included studies from all parts of the world, providing a global perspective of the COVID-19 pandemic's impact on orthopaedic and trauma consultations and admissions. In the future, pandemics may happen, but this one taught everyone to make a plan and be prepared if one happens again.

In conclusion, during the COVID-19 pandemic, orthopaedic and trauma surgeries, greatly decreased all over the world. The challenges have been immense in this pandemic, but we somehow adapted our entire way of thinking and taking care of patients by improvising in our work methods. In the future, pandemics may happen again, and a plan should be put in place to take care of patients who will not be able to come to hospitals for emergency and urgent care.

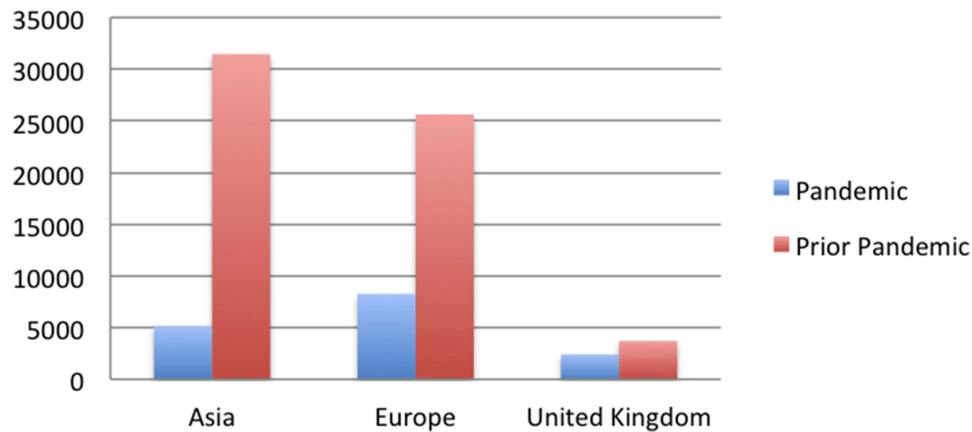


Figure 2 Data from three regions with most reports.

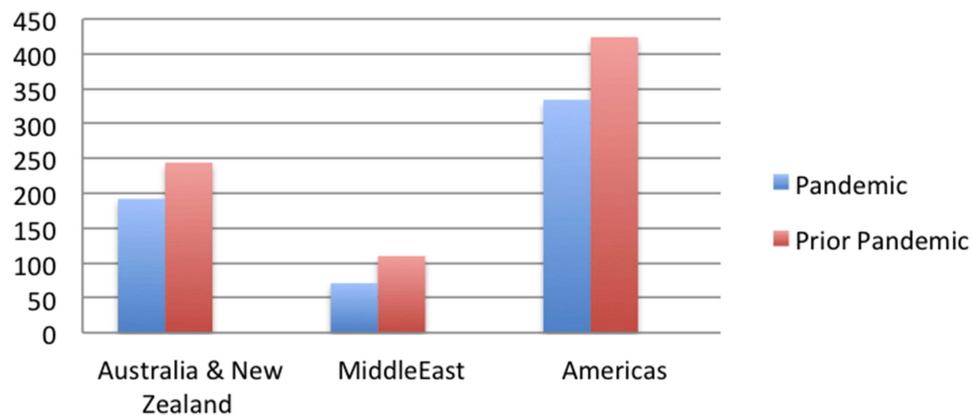


Figure 3 Regions with lowest cited reports.

Disclosure

The author reports no conflicts of interest in this work.

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