

The Epidemiology of Fractures and Muskulo-Skeletal Traumas During COVID-19 Lockdown: A Detailed Survey of 17.591 Patients in a Wide Italian Metropolitan Area

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Abstract

Introduction: On 9 March 2020 the Italian Government declared a national lockdown to curb the spread of Covid-19. The aim of our study was to analyze the effects of such intervention on the traumatological emergency service, with particular emphasis on variations in trauma incidence and patients' characteristics. **Materials and Methods:** An observational analysis was performed. Medical records were collected from 3 different trauma centers within a wide metropolitan area, and compared between 2 time periods: the full Italian lockdown period and the same period from the past year. The study population included all patients who were admitted to the Emergency Department (ED). For those who accessed for orthopedic reasons, the analyzed variables included the date of ED admission, age, gender, after visit discharge or hospitalization, place where the injury occurred, traumatic mechanism, diagnosis, relationship with sport activity, and time from injury/symptoms debut to ED access. **Results:** A total of 17591 ED accesses and 3163 ED trauma visits were identified. During the lockdown, ED trauma visits decreased by -59.8%, but required patient's hospitalization significantly more frequently. The rate of ED trauma admissions in the elderlies significantly increased, together with the proportion of fragility fractures such as hip fractures. Road accident traumas (-79.6%) and sport-related injuries (-96.2%) significantly dropped. Admissions for less-severe reasons such as atraumatic musculoskeletal pain significantly decreased (-81.6%). **Conclusions:** The lockdown reduced the pressure on the Health System in at least 2 ways: directly, by curbing viral transmission and indirectly, by more than halving the ED trauma visits. Nonetheless, we observed an increased proportion of traumas in older patients, requiring hospitalizations, while the rate of less-severe cases decreased. This analysis may raise awareness of the effects of a lockdown on trauma services and may be helpful for those ones around the world who are now facing the emergency.

Keywords

COVID-19, pandemic, trauma, injury, lockdown, emergency

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Introduction

On March 11, 2020, the World Health Organization (WHO) declared the spread of coronavirus 2019 (COVID-19), now known as severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), a pandemic.¹⁻³ As of September 2, 2020, the virus has spread in 216 countries with over 25.000.000 confirmed cases, claiming more than 850.000 lives.⁴ Previously, in February 2020, Italy found itself becoming the epicenter for COVID-19 in Europe and faced one of the most severe

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outbreaks in the world, with nearly 270,000 confirmed cases and more than 35,000 deaths up to date (September 2, 2020).^{5,6} After the first person-to-person transmission on February 21, in Codogno, Lombardy, an infection chain led to a rapid spread of the virus. Within 24 hours, 36 new cases emerged in Lombardy and Veneto, leading the Italian Government to extraordinary measures.⁷ To contain the emerging threat, on February 23, the Government established a “red zone” of 11 towns and put them on lockdown, trying to minimize the likelihood that infected people came into contact with not infected ones.⁸ Despite this move, new cases kept raising and went from 1577 on March 1, to 7375 in just a week.⁷ Mathematical models predicted that if this trend continued, the number of patients requiring Intensive Care Unit (ICU) hospital treatment would have increased so much, that the number of ICU inpatients beds would have quickly reached saturation, picturing a dramatic scenario.⁶ For this reason, in order to curb the transmission and to avoid the National Health System (NHS) from collapsing, the Government increasingly extended the red zone. Eventually, on March 9, 2020, the entire country was declared under lockdown.⁹ Movement of individuals was limited in the whole Italian national territory unless strictly motivated by health or work reasons. Schools, universities, law courts stopped their activity. Museums, cinemas, theaters, and any other cultural, social, or recreational meeting place had to stay closed. Any private or public gathering, including sports events, mass, and funerals, was forbidden. Most shops had to stay closed. Only essential services such as supermarkets, pharmacies, or banks stayed open, although ensuring that customers would observe a minimum distance of 1 meter from each other and use face masks.

Over the course of the outbreak, the Italian NHS adopted many extensive organizational rearrangements, in order to face the worsening emergency state. Non-emergency procedures as elective surgeries were canceled or postponed. Many medical doctors, including Orthopedics, and nurses shifted in emergency departments, medical wards or COVID dedicated ICUs. Specific pathways and dedicated operating rooms were created for COVID patients. Certain hospitals were converted to COVID+ hubs and others were identified as COVID-free hubs.¹⁰

Since social distancing strategies was adopted, the R_0 (basic reproductive rate) began decreasing and, on day 28 from the institution of the national lockdown, R_0 finally reached <1 .¹¹ The lockdown phase, also called “Phase 1,” ended on May 3, after 55 days. Hereafter, restriction measures were progressively relieved and “Phase 2” began.¹² Such measures effectively curbed viral transmission and allowed the NHS to cope with the massive load of COVID patients. However, other indirect effects of the lockdown possibly helped to relieve the pressure on the NHS. Limited movements of individuals and a higher-sedentary lifestyle, could have played a role by reducing the incidence of traumas and their weight on the Emergency Departments (EDs). Aim of our study was: 1) to evaluate the impact of the Italian lockdown on the traumatological service in a wide metropolitan area, 2) to evaluate any variation in

patients and traumas characteristics related to the lockdown. A cohort study was conducted.

Materials and Methods

Emergency Departments databases and trauma registries from 3 Trauma centers were reviewed and compared between 2 periods: the full Italian lockdown period (from 10 March 2020 to 3 May 2020, from now on referred to as Lockdown period) and the same period from the past year (from 10 March 2019 to 3 May 3 2019, from now on referred to as 2019* period).

All 3 Trauma centers are located in Cagliari, the capital city of Sardinia, and together they cover a catchment area of more than 560,000 inhabitants.¹³ They are the Marino Hospital (Level I Trauma Centre), the Trauma unit at Santissima Trinità Hospital (Level I Trauma Centre), and the Trauma Unit at Azienda Ospedaliera Brotzu (AOB) (Hub, specialized in poly-traumas). Following Regional directives, on the beginning of March 2020, the Santissima Trinità Hospital was converted into a COVID hub. For this reason, over the course of the lockdown, the full load of trauma patients was redirected to Marino Hospital and AOB Trauma unit only, except in cases of confirmed COVID-19 positiveness.

The study population included all patients who were admitted to the ED and required the visit of an Orthopedic and Traumatology consultant. Inpatients admitted for elective surgery were excluded. Any trauma patient admitted to the ED twice or more during the time intervals, was counted separately for each episode. Inpatients who were transferred from a Trauma unit to another within the analyzed hospitals were counted only once. The total number of ED admissions in the 2 analyzed periods was collected to calculate the rate of admissions for orthopedic and trauma reasons only.

Quantitative variables included the age and date of ED admission. Qualitative variables included age group, gender, whether the patient was discharged after the ED trauma visit or hospitalized, the place where the injury occurred, traumatic mechanism, diagnosis, relationship with sport activity, and time from injury/symptoms debut to ED access ($>$ or $<$ than 48 hours).

The population was categorized into 6 age groups: pediatric (<14 years), adolescence-youth (15 to 24 years), young adult (25 to 44 years), adults (45 to 64), early elderly (65 to 79 years), and late elderly (> 80 years).

Since there was high data variability, we classified places, traumatic mechanisms, and diagnoses into sub-groups.

Places were classified into: (1) home; (2) sports facility (e.g. gyms, fields, courts, swimming pools, etc.), (3) workplace, (4) shop, (5) residential/nursing home, (6) school, (7) street (roads and sidewalks), (8) outdoor—meant as any outdoor place which was off limit during the lockdown—(e.g. parks, beaches, trails, etc.) and (9) place n/a (always related to atraumatic mechanisms).

Traumatic mechanisms were classified into: (1) fall from standing position, (2), fall from height, (3) blunt and/or strain trauma, (4) road accident trauma, (5) wound trauma,

Table 1. ED Overall Visits, After Orthopedic Visit Result (Discharge or Hospitalization), Time From Injury/Symptoms to ED Access, Age Groups.

	CASES			PROPORTION %			
	2019*	Lockdown	trend %	2019*	Lockdown	△	P value
ED OVERALL VISITS	12.743	4.848	-62,0%				
Not Orthopedic reason	10.487	3.941	-62,4%	82%	81%	-1,0	< 0.001
Orthopedic reason	2.256	907	-59,8%	18%	19%	+1,0	0,1
ED ORTHOPAEDIC VISITS							
Not-Hospitalized	1.868	686	-63,3%	83%	76%	-7,2	0,04
Hospitalized	388	221	-43,0%	17%	24%	+7,2	< 0.001
TIME FROM INJURY/SYMPTOMS TO ED ACCESS							
Early (<48 h)	2.080	885	-57,5%	92%	98%	+5,4	0.2
Delayed (>48 h)	176	22	-87,5%	8%	2%	-5,4	< 0.001
AGE GROUPS							
0-14	139	57	-59,0%	6%	6%	+0,1	0,9
15-24	272	34	-87,5%	12%	4%	-8,3	< 0.001
25-44	471	147	-68,8%	21%	16%	-4,7	0,007
45-64	648	277	-57,3%	29%	31%	+1,8	0,4
65-79	415	207	-50,1%	18%	23%	+4,4	0,01
80+	311	185	-40,5%	14%	20%	+6,6	< 0.001

Comparison of the number of cases and rate between the analyzed periods.

(6) aggression, (7) atraumatic etiology (e.g. atraumatic musculoskeletal pain, atraumatic tendon lesions) and (8) other.

Diagnoses were classified into general and specific. General diagnoses included only the injury type (e.g. fracture, blunt and/or strain, dislocation, wound, amputation, polytrauma, tendon lesion, musculoskeletal pain). Specific diagnoses included the injury type and the anatomical areas (e.g. proximal femoral fracture, ankle blunt and/or strain trauma, shoulder dislocation). Patients with more than 1 fracture were grouped into multiple fractures and each fracture was listed. For practical reasons, polytrauma and wounds were not sub-grouped. In “other” we included a small variety of diagnoses that were not assignable to any other group (e.g. casting intolerance or breakage, infections, internal fixation intolerance, etc.).

Statistical Analysis

Data were extracted on Microsoft Excel sheets. A descriptive analysis of variables differences was conducted. Age was expressed as the mean \pm standard deviation (SD). Qualitative variables were reported using the number of cases (absolute values – unweighted data) and rates (percentual – weighted data). The absolute values variation was reported in percentage (trend %) and the rate variation in percentual points (p.p.) difference (Δ). The data obtained were statistically analyzed using χ^2 test, with a 95% confidence interval (CI). We considered a 2-tailed *p*-value of ≤ 0.05 significant and of ≤ 0.001 highly significant. Data were analyzed using Microsoft Excel software.

Results

A total of 17.591 patients medical records were analyzed. Considering any medical reason, during the Lockdown period

4.848 patients were admitted at the EDs, registering a decrease of -62,0% compared to 2019* period.

A total of 3163 ED visits for orthopedic and trauma reasons were identified: 2.256 in 2019* vs 907 in the Lockdown period (-59.8%), representing the 19% of the total of ED visits (+1% from 2019*). Patients' mean age registered a mean increase of +6.5 years, going from a mean of 51 years (range 1-103) in the 2019*, to a mean of 57.5 years (range 2-100) in the Lockdown. Gender did not significantly change: females were 56.1% in 2019* and 59.7% in the Lockdown (*p* = 0.06).

Hospitalizations for trauma reasons also decreased, going from 388 in 2019* to 221 in the Lockdown. However, the hospitalization rate registered a highly significantly increase from 17% to 24% (*p* < 0.001).

Delayed ED presentations dropped (-87.5%) and their rate decreased from 8% to 2% of all orthopedic and trauma visits (*p* < 0.01). No COVID+ patients required traumatological assistance during the Lockdown period.

Injury rate in the <14 years (*p* = 0.9) and in the 45-64 years (*p* = 0.9) age groups did not significantly change between the analyzed periods. Among the 15-24, and 25-44 years age groups instead, we registered a significant decrease of injury rate (*p* < 0.001 and *p* = 0.007), while in the 65-79 years (*p* = 0.01) and > 80 years (*p* < 0.001) groups it significantly increased. These data are showed in Table 1.

Road accident traumas and atraumatic etiology cases registered the most significant decrease during the Lockdown. Road accident traumas drastically dropped (-79.6%) and their proportion highly significantly decreased from 11% to 6% (*p* < 0.001). Likewise, atraumatic aetiologies cases highly significantly decreased (-80.8%) and their proportion went from 9% to 5% (*p* < 0.001). All fall-related traumas proportionally increased highly significantly (*p* = 0.004). We also registered

Table 2. Traumatic Mechanisms, Sport-Relationship of the Injuries and Place Where They Occurred.

	CASES		trend %	PROPORTION %		△	P value
	2019*	Lockdown		2019*	Lockdown		
TRAUMATIC MECHANISMS							
Fall from standing position	1.292	599	-53,6%	57%	66%	+8,8	0,004
Blunt and/or Strain trauma	303	127	-58,1%	13%	14%	+0,6	0,7
Road accident trauma	245	50	-79,6%	11%	6%	-5,3	< 0.001
Atraumatic etiology	214	41	-80,8%	9%	5%	-5,0	< 0.001
Fall from height	83	55	-33,7%	4%	6%	+2,4	0,004
Wound trauma	79	29	-63,3%	4%	3%	-0,3	0,7
Aggression	38	5	-86,8%	2%	1%	-1,1	0,01
Other	2	1	-50,0%	0%	0%	+0,0	0,9
SPORT-RELATED							
No	1.970	896	-54,5%	87%	99%	+11,5	0.002
Yes	286	11	-96,2%	13%	1%	-11,5	< 0.001
PLACES							
Home	942	647	-31,3%	42%	71%	+29,6	< 0.001
Street	635	119	-81,3%	28%	13%	-15,0	< 0.001
Sports facility	252		-100,0%	11%	0%	-11,2	< 0.001
Place n/a	173	35	-79,8%	8%	4%	-3,8	< 0.001
Workplace	120	70	-41,7%	5%	8%	+2,4	0,01
Outdoor	63		-100,0%	3%	0%	-2,8	0,007
School	28		-100,0%	1%	0%	-1,2	0,07
Residential/nursing home	24	20	-16,7%	1%	2%	+1,1	0,01
Shops	19	16	-15,8%	1%	2%	+0,9	0,03

Comparison of the number of cases and rate between the analyzed periods.

a significant drop in aggression-related cases (-86.8%; $p = 0.01$). The rate of wound and blunt and/or strain traumatic mechanisms remained relatively stable ($p = 0.07$). Finally, we registered a highly significant decrease in sport-related injuries (-96.2%), which proportionally dropped from 13% to 1% ($p < 0.001$).

As expected, during the Lockdown no traumas occurred at school ($p = 0.07$), sports facilities ($p < 0.001$) and in all those places that became off-limits (outdoor) ($p = 0.007$). Homes and streets were the 2 most frequent places for injury occurrence in both analyzed periods. Street injuries dropped (-81.3%) and their rate highly significantly decreased by 15p.p. ($p < 0.001$). Home injuries cases, despite decreasing (-31.3%) in the Lockdown, showed a proportional increase from 42% to 71% ($p < 0.001$). Injuries at the workplace, residential/nursing homes, and shops decreased, but all their rates significantly increased ($p < 0.05$). These data are showed in Table 2.

Distal radius fracture was the most common diagnosis overall in both periods and also the most represented among the Not-Hospitalized group. Despite the number of distal radius fractures decreased in the Lockdown, their proportion significantly increased by 2.3p.p. ($p = 0.05$). The proximal femoral fracture was the most represented diagnosis among the Hospitalized group. Despite decreasing in number (-21.1%), their proportion highly significantly increased by 5.2p.p. ($p < 0.001$).

Blunt and/or strain trauma was the most common among the general diagnoses in both periods. Among them, the ankle was the most affected anatomical region. Ankle blunt and/or strain traumas, decreased by -72.7%, but did not register a significant

variation in their rate ($p = 0.9$). Knee blunt and/or strain traumas, instead, highly significantly decreased (-77.2%; rate -2.8 p.p.; $p = 0.003$). Although wounds and amputations/sub-amputations more than halved during the Lockdown, their proportion remained stable ($p = 0.5$). We also observed that ED trauma visits for musculoskeletal pain (in 94.8% of cases by atraumatic etiology) highly significantly dropped from 163 to 30 cases (rate from 7% to 3%; $p < 0.001$). Among them, the most significantly decreased were backpain ($p = 0.02$) and shoulder pain ($p = 0.01$). Finally, we observed that polytraumas went from 10 to 6 cases, but their proportion remained stable during the Lockdown ($p = 0.4$). These data are showed in Table 3.

Discussion

The COVID-19 Lockdown, which was declared in Italy from 9 March 2020, inevitably changed the behavior of an entire population, confining people in the domestic environment, interrupting sports activities and reducing road traffic. Moreover, many extensive organizational rearrangements of health-care system were made, and hospitals were converted to COVID+ hubs and others were identified as COVID-free hubs in the entire national territory. The purpose of our survey was to evaluate whether the COVID-19 Lockdown has affected the incidence of traumatic events and fractures in the population of a wide metropolitan area by monitoring the number of visit performed by orthopedic consultants in the Emergency Department of the Cagliari Metropolitan Area.

Table 3. General Diagnosis, Specific Diagnosis and Fractures.

GENERAL DIAGNOSIS	CASES			PROPORTION %		△	P value
	2019*	Lockdown	trend %	2019*	Lockdown		
Blunt and/or strain	835	307	-63,2%	37%	34%	-3,2	0,2
Upper limb fracture	523	222	-57,6%	23%	24%	+1,3	0,5
Lower limb fracture	360	201	-44,2%	16%	22%	+6,2	< 0,001
Musculoskeletal pain	163	30	-81,6%	7%	3%	-3,9	< 0,001
Wound/amputation	119	43	-63,9%	5%	5%	-0,5	0,5
Dislocation	75	21	-72,0%	3%	2%	-1,0	0,1
Vertebral fracture	70	25	-64,3%	3%	3%	-0,3	0,6
Pelvic fracture	31	20	-35,5%	1%	2%	+0,8	0,1
Tendon lesion	31	9	-71,0%	1%	1%	-0,4	0,4
Multiple fracture	23	16	-30,4%	1%	2%	+0,7	0,09
Other	16	7	-56,3%	1%	1%	+0,1	0,9
Polytrauma	10	6	-40,0%	0%	1%	+0,2	0,4
SPECIFIC DIAGNOSIS (TOP 10 of 2019*)							
Not hospitalized							
1. Distal radius fracture	177	90	-49,2%	9%	13%	+3,6	
2. Ankle blunt and/or strain trauma	177	71	-59,9%	9%	10%	+0,9	
3. Knee blunt and/or strain trauma	149	34	-77,2%	8%	5%	-3,0	
4. Hand blunt and/or strain trauma	129	43	-66,7%	7%	6%	-0,6	
5. Finger phalanx fracture	101	18	-82,2%	5%	3%	-2,8	
6. Wound	92	25	-72,8%	5%	4%	-1,3	
7. Proximal humeral fracture	81	27	-66,7%	4%	4%	-0,4	
8. Wrist blunt and/or strain trauma	62	13	-79,0%	3%	2%	-1,4	
9. Foot blunt and/or strain trauma	60	46	-23,3%	3%	7%	+3,5	
10. Backpain	60	20	-66,7%	3%	3%	-0,3	
Hospitalized							
1. Proximal femoral fracture	123	97	-21,1%	32%	44%	+12,2	
2. Proximal humeral fracture	25	13	-48,0%	6%	6%	-0,6	
3. Malleoli fracture	25	9	-64,0%	6%	4%	-2,4	
4. Distal radius fracture	16	9	-43,8%	4%	4%	-0,1	
5. Femoral diaphysis fracture	15	8	-46,7%	4%	4%	-0,2	
6. Wound	13	7	-46,2%	3%	3%	-0,2	
7. Lumbar vertebrae fracture	18	13	-27,8%	5%	6%	+1,2	
8. Pelvic fracture	17	1	-94,1%	4%	0%	-3,9	
9. Tibial and/or fibular diaphysis fracture	13	2	-84,6%	3%	1%	-2,4	
10. Proximal tibial fracture	10	2	-80,0%	3%	1%	-1,7	
FRACTURES (TOP 10 of 2019*)							
1. Distal radius fracture	193	99	-48,7%	20%	21%	+1,6	0,05
2. Proximal femoral fracture	123	97	-21,1%	13%	21%	+8,3	< 0,001
3. Proximal humeral fracture	106	40	-62,3%	11%	9%	-2,2	0,7
4. Finger phalanx fracture	102	20	-80,4%	10%	4%	-6,2	0,003
5. Malleoli fracture	75	32	-57,3%	8%	7%	-0,8	0,8
6. Metatarsal fracture	59	20	-66,1%	6%	4%	-1,7	0,5
7. Lumbar vertebrae fracture	55	16	-70,9%	6%	3%	-2,2	0,3
8. Metacarpal fracture	53	15	-71,7%	5%	3%	-2,2	0,2
9. Pelvic fracture	30	20	-33,3%	3%	4%	+1,2	0,08
10. Proximal tibial fracture	19	2	-89,5%	2%	0%	-1,5	0,052
All others	159	114	-28,3%	16%	25%	+8,3	
Overall fractures	974	463	-52,5%	100%	100%		

Comparison of the number of cases and rate between the analyzed periods.

This analysis highlighted a general decrease in ED trauma visits by -59.8% over the course of the lockdown (Figure 1).

This finding gives the opportunity to do multiple observations. During the lockdown, no inward and outward movement of any person within the national territory was allowed, including movements between neighboring towns. Several

checkpoints were installed across the roads and strict action was taken against those who violated the prohibition. As a matter of fact, from day 1, streets became almost deserts. Indeed, as observed in this analysis, there was a statistically significant reduction of injuries occurred in the streets during the Lockdown (-81.3%). Road accident traumas, the 3 rd most

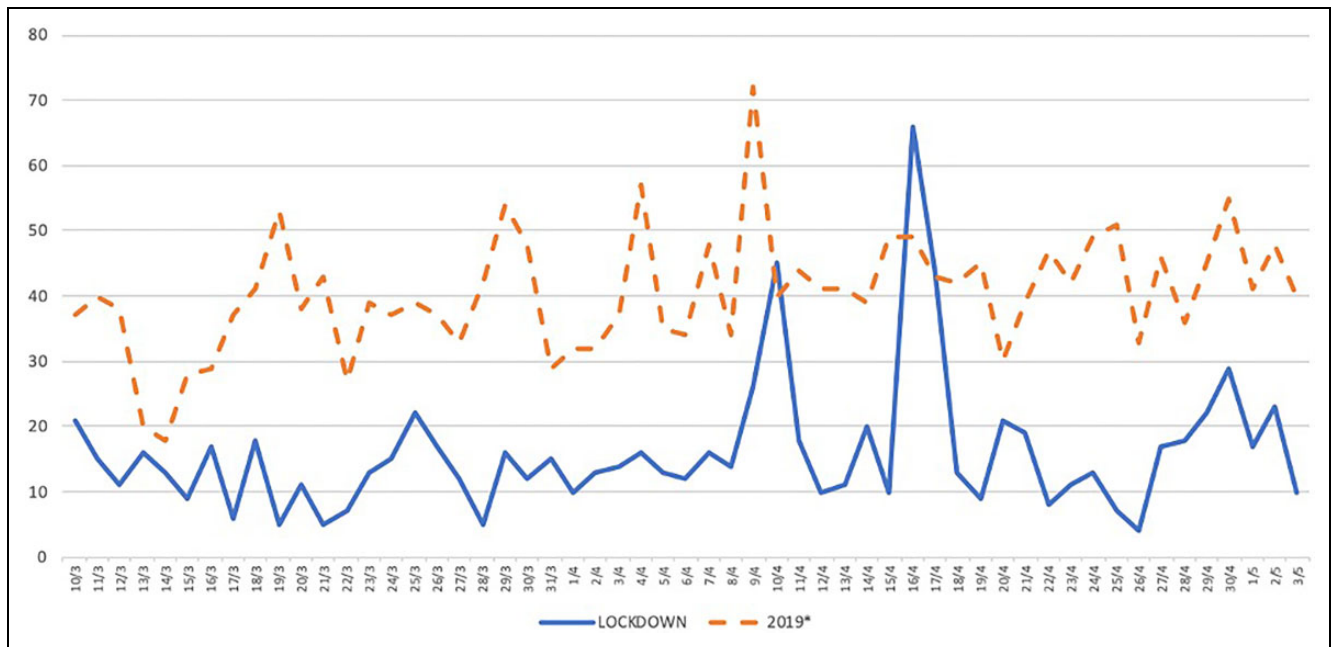


Figure 1. The figure shows the number of daily visits for orthopedic reasons at the emergency department with a comparison between the 2019* period (dashed line) and the Lockdown period (continuous line).

common reason for ED trauma admission of 2019*, highly significantly dropped. This result is in line with other literature reports.¹⁴

The strict rules of the Italian lockdown forced people to a high-sedentary lifestyle and a less-risky behaviors. As sports facilities closed and outdoor areas became off-limits, sports injuries highly significantly decreased (-96.2%). Only 11 patients requested ER trauma visit for sport-related injuries, occurred while exercising at home. Among sports injuries, the most common overall was knee blunt and/or strain trauma, the rate of which indeed significantly reduced. Moreover, ED trauma admissions significantly decreased in the adolescence-youth and young adult age groups (15 to 44 years), which are likely the most sport active populations.

“*To resto a casa*”—“Stay home”—was the so-called name given to the Government ordinance that put Italy in lockdown. Not surprisingly we observed a significant increase in home injury rate compared to 2019*. In the COVID era, people became used to concepts such as home-schooling and smart-working, as houses turned into schools for children and workplaces for adults. Among the home injuries, we observed an increased rate of polytraumas and multiple fractured patients. An explanation could be that since many repairmen stopped working, some people found themselves performing odd jobs and repairs at home on their own, perhaps without expertise or safety measures. Moreover, at home people spent more time in activities such as cleaning and cooking,¹⁵ which could explain the increased rate of finger sub-amputations.

COVID-19 appears to most severely affect the elderly and the frail with comorbidities.¹⁶ Although isolation has saved many lives, on the other hand it represented a serious health concern for the elderly, for the increased risk of cardiovascular,

neurocognitive, mental health problems.¹⁷ Alone and vulnerable in this situation, there was also a reliable heightened risk for injuries. In our analysis, we reported a significant increase of ED trauma admissions among the elderly (> 65years). We observed a statistically significant increase in fragility fractures rate, such as distal radius fractures and proximal femoral fractures. Vertebral fractures rate remained stable. We also noticed a significant increment of trauma rate among residential/nursing homes. The pediatric population (<14 years), on the other hand, seemed not to be significantly affected by the lockdown and the rate of ED trauma accesses stayed equal to 2019*.

We observed a significant increase in fall from height rate. One of them, a fall from 5 meters, was a suicidal attempt. According to the Brain Research Foundation, the economic and social consequences of the pandemic may have a strong impact on mental health. For this reason, they instituted the COVID-19 Suicides Observatory. From the beginning of March, 41 suicides and 28 attempts were reported in Italy.¹⁸ Whether our case was related to COVID-19 was not determined, but this issue calls for public attention and healthcare workers’ awareness, including Orthopedics. Social-distancing may also increase the risk of family violence and worldwide reported cases of domestic violence dramatically raised.¹⁹ However, our analysis showed a significant reduction in aggression-related injuries.

Another interesting finding of our analysis is the highly statistically relevant variation in hospitalization rate after ED trauma admission. This may be explained by the increase of patients’ mean age (+6.5 years), the increased rate of elderly ED trauma accesses, the decrease of admissions for less-severe cases, and by the distribution of traumas rate toward surgery-requiring cases, such as proximal femoral fracture,

which was the most represented diagnosis among the Hospitalized group. Another study conducted by Nunez et. al reported similar results.²⁰

Diagnoses such as atraumatic musculoskeletal pain (back-pain, shoulder pain, knee pain, hip pain) in 2019* counted for the 6.7% of all ED trauma visits, while in the Lockdown counted for the 3%. This difference was highly statistically significant. Crowding is a well-known major issue for many EDs worldwide. Since Italian emergency service offers a free of charge immediate assistance, every year many patients un-appropriately flood the EDs with nonurgent problems.²¹ The global awareness of the risks of contagion in hospitals might have inhibited patients from referring to ED for minor problems. This said, reduced mobility caused by less physical activity and long hours sitting due to smart working adoption, perhaps could have been the predisposing factors to increased backpain cases.²² A reliable explanation could be that the tendency to overuse the ED, for unjustified nonurgent accesses, decreased and patients referred to the emergency service more properly in the lockdown. This theory could also be supported by the highly significant decrease of ED delayed accesses rate during the Lockdown period (from 8% to 2%), although the fear of contagion might still have played a role.

The limitation of the current study is its retrospective design. Strengths are that it analyzed the full Italian lockdown period, collecting various quantitative and qualitative data, from 3 different trauma centers (2 level-I trauma centers and 1 HUB), with large sample size.

Conclusions

The pandemic reshaped our lives in many different ways, bringing up new challenges and redefining roles. The Italian NHS is facing the biggest challenge in its history and every single citizen plays a crucial role in the COVID-19 fight. Whether working in hospitals or staying at home, only through cooperation and solidarity we will overcome this major challenge. The lockdown resulted in an effective move because it reduced the pressure on the NHS in at least 2 ways: directly, by curbing viral transmission and indirectly, by more than halving the ED trauma visits. Nevertheless, from an orthopedic and traumatological perspective, it's necessary to take into account an increased rate of surgery-requiring traumas in older patients, while the rate of accesses for non-emergent and less-severe cases decreased. This analysis may raise awareness of the effects of a lockdown on trauma services and may be helpful for those ones around the world who are facing the emergency or will in the future. Finally, it should make us reflect upon the correct use of emergency services and reconsider a reinforcement of the public health outpatient settings.

Declaration of Conflicting Interests

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Supplemental Material

Supplemental material for this article is available online. For all specific diagnoses results please refer to the online supplementary table (Table 4).

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