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The impact of COVID-19 on the psychiatric emergency departments of two Italian hospitals in Milan

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ABSTRACT

During the first wave of the SARS-CoV-2 contagion in Italy, mental health care services continuity has been granted to the general population. Emergent and urgent conditions, however, are managed in collaboration with Emergency Departments (EDs). This collaboration may have suffered from the overload of the EDs due to the high number of SARS-CoV-2 positive patients. In this perspective, we analysed the possible impact of COVID-19 on the EDs accesses of psychiatric patients in two of the main hospitals of Milan, the “Luigi Sacco” Hospital and the “Fatebenefratelli” Hospital, comparing their admissions between the periods of March, April and May 2019 and 2020.

We found a significant reduction in the number of evaluated patients in 2020 in both EDs. Emergency Medical Services (EMSs) brought a significant lower number of patients to the ED of Sacco Hospital during 2020, while this number increased for the ED of Fatebenefratelli Hospital, confirming the hypothesis that the overload of the Sacco Hospital ED significantly influenced the possibility to receive a psychiatric evaluation there. Moreover, we found a significant difference between diagnosis at discharge of the different samples.

1. Introduction

Italy has been and is currently one of the most affected nations by the SARS-CoV-2 pandemic. During the first wave of the pandemic in Italy, between March and May 2020, contagion spread widely and rapidly especially in the north of Italy. To manage the ongoing health emergency, health authorities of Lombardy region recommended the interruption of both private and public out-patient visits for non acute conditions, particularly in hospitals involved in the management of the pandemic, but granted the access to psychiatric services for the population, in both hospitals and territorial facilities. Mental Health Services in Lombardy are constituted by 27 Departments of Mental Health and Addiction Services. Patients are taken in charge by specific departments on the basis of their residential area; each department comprises a series of different mental health services, from hospital wards to communities and territorial facilities (Fattore et al., 2000). Although psychiatric care is often managed in territorial facilities, the Emergency Department

(ED) remains one of the major points of access to the attention of a psychiatrist for emergent and urgent conditions and for non-resident subjects. Nevertheless, the management of EDs accesses through Emergency Medical Services (EMSs) is managed by AREU (Azienda Regionale Emergenza Urgenza; Regional Company for Emergencies and Urgencies), which directs EMSs to the closest and more suitable ED for the management of each different patient. In this regard, during the first wave of the pandemic, the EDs of Sacco Hospital and Fatebenefratelli (FBF) Hospital have been used as access points for different diseases: the majority of COVID-19 positive subjects were sent to Sacco Hospital ED, being it one of the main Italian centre for Infectious Diseases. Therefore, the possibility of accepting patients who needed a psychiatric evaluation was subordinated to the number of COVID-19 positive patients taken in charge at that moment at the ED. Overall, many studies focused on the impact of the pandemic and the lockdown on mental health in the general population (Fiorillo et al., 2020; Giallonardo et al., 2020) and in specific psychiatric populations (Dubey et al., 2020; Fineberg et al.,

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2020; Sher, 2020; Yahya et al., 2020), however, the majority of the studies focus on the possible long-term impact of the pandemic, while very few studies focus on the short-term impact of the pandemic on psychiatric patients. For this reason, we aimed to analyse possible differences between accesses to the EDs of Sacco Hospital and FBF Hospital, comparing socio-demographic and clinical characteristics of patients who accessed to the two EDs in the months of March, April and May of both 2019 and 2020, in order to evaluate the impact of SARS-CoV-2 pandemic on emergency and urgency psychiatric services. We hypothesized that the fear of contagion and the overload of EDs could reduce the number of evaluated patients, while the social, economic and work-related stressors could increase the number of patients requiring evaluation.

2. Methods

We evaluated every access to the ED of Luigi Sacco Hospital and FBF Hospital in Milan, Italy, from March to May 2019 and 2020. Every subject needing a psychiatric evaluation was included in the study and assessed as follows. We evaluated sociodemographic (age and gender) and clinical aspects (diagnosis, substance use, suicide attempts, psychiatric follow-up), as well as mean of access to the ED (EMS and police intervention) and diagnosis at discharge from the ED (discharge, psychiatric hospitalization, non-psychiatric hospitalization, transfer to other psychiatric facility, ED abandonment, refusal of hospitalization). For accesses registered in 2020, we also evaluated the presence of a diagnosed SARS-CoV-2 infection. We then proceeded to analyse how the abovementioned variables changed in the two evaluated periods and to confront those variables in the two facilities and between 2019 and 2020.

Descriptive and statistical analyses were performed with GraphPad Prism 9.0 (GraphPad Inc., La Jolla, California, USA). Continuous variable were analysed by Kruskal-Wallis test and Dunn's multiple comparison test, while categorical variables were analysed by χ^2 and Fisher's exact test when possible. A P-value < 0.05 was considered statistically significant.

3. Results

We analysed a total number of 1235 accesses to the ED of "Luigi Sacco" and "FBF" Hospitals, during the months of March, April and May of 2019 and 2020. In 2019, 817 accesses required a psychiatric evaluation, while only 418 accesses required a psychiatric evaluation in 2020. Accesses to the ED of "Luigi Sacco" hospital suffered a reduction of 68% between the two analysed periods, while accesses to the ED of "Fatebenefratelli" were reduced by 34,8%. Sociodemographic and clinical characteristics of the sample are shown in Table 1.

During 2020 there was a significant increase in the EMSs mean of access to the ED compared to 2019 ($p < 0.0001$), in both Sacco Hospital (37.2% vs. 55.4%, $p < 0.001$) and FBF Hospital (62.2% vs. 75.6%, $p < 0.0001$, Fig. 1), this increment being more significant for FBF than Sacco Hospital ($p < 0.0001$). Moreover, we found a significant difference in terms of diagnosis at discharge during the two evaluated periods ($p < 0.0001$, Fig. 2), with an increased rate of Personality Disorders and Organic Diagnosis along with a reduced rate of Depressive and Anxiety Disorders in the discharge diagnosis of Sacco Hospital in 2020 compared to 2019 ($p < 0.001$).

In relation to Substance Use related accesses, we did not find any significant difference between the evaluated samples. Analysing the number of Suicide Attempts brought to the attention of the EDs, we found a significant difference between those evaluated at Sacco Hospital and FBF Hospital in 2019 (6.9% vs. 2.7%, $p < 0.01$). Moreover, suicide attempts were (non significantly) reduced at Sacco Hospital during 2020 compared to 2019 (6.9% vs. 4.5%). Considering the presence of a psychiatric follow-up for the evaluated patients, we observed an increment in the percentage of previously known patients evaluated at Sacco

Table 1
Socio-demographic and clinical aspects of evaluated samples.

	Sacco Hospital ED – 2019	Sacco Hospital ED – 2020	FBF Hospital ED – 2019	FBF Hospital ED – 2020
N° visits	344	110	473	308
Age (mean +/- SEM)	44.08 +/- 0.98	46.71 +/- 1.52	41.5 +/- 0.81	44.92 +/- 1.02
Sex - N°F (%)	175 (50.9%)	53 (48.2%)	234 (49.5%)	144 (46.7%)
Access				
Independent	188 (54.6%)	40 (36.4%)	143 (30.2%)	53 (17.2%)
EMSs	128 (37.2%)	61 (55.4%)	294 (62.2%)	233 (75.6%)
Police	28 (8.2%)	9 (8.2%)	36 (7.6%)	22 (7.2%)
Diagnosis (%)				
Depressive Disorder	66 (19.2%)	7 (6.4%)	43 (9.1%)	28 (9.1%)
Bipolar Disorders	26 (7.6%)	12 (10.9%)	37 (7.8%)	21 (6.8%)
Psychosis	74 (21.5%)	22 (20%)	107 (22.6%)	76 (24.7%)
Personality Disorders	31 (9%)	23 (20.9%)	114 (24.1%)	66 (21.4%)
Anxiety Disorders	46 (13.4%)	8 (7.3%)	69 (14.6%)	41 (13.3%)
Other psychiatric conditions	55 (16%)	19 (17.3%)	70 (14.8%)	47 (15.2%)
Organic Disorders	16 (4.6%)	10 (9.1%)	33 (7%)	28 (9.1%)
Missing	30 (8.7%)	9 (8.1%)	0	1 (0.4%)
Substance Use (%)	85 (24.7%)	31 (28.2%)	149 (31.5%)	103 (33.4%)
Suicide Attempt (%)	24 (6.9%)	5 (4.5%)	13 (2.7%)	9 (2.9%)
Psychiatric Follow-up (%)	162 (47.1%)	76 (69.1%)	355 (75.2%)	217 (70.4%)
Outcome (%)				
Discharge	211 (61.3%)	55 (50%)	288 (60.9%)	201 (65.3%)
Psychiatric hospitalization	69 (20.1%)	6 (5.5%)	137 (28.9%)	83 (26.9%)
Non-psychiatric hospitalization	12 (3.4%)	11 (10%)	20 (4.3%)	9 (2.9%)
Abandonment / Refusal	52 (15.2%)	11 (10%)	28 (5.9%)	15 (4.9%)
Covid-19 + (%)		11 (10%)		3 (0.9%)

Hospital in 2020 compared to 2019 (69.1% vs. 47.1% $p < 0.0001$). Of note, although the percentage of previously known patients evaluated at the FBF Hospital decreased in 2020 compared to 2019 (75.2% vs. 70.4%), no significant difference was found between the two samples (Fig. 3). Moreover, considering the outcome of the ED visits (Fig. 4), the percentage of discharged patients decreased significantly at Sacco Hospital in 2020 compared to 2019 (50% vs. 61.3%, $p < 0.01$), along with a significant increase of hospitalized patients, both in psychiatric (34.5% vs. 20.1%) and non-psychiatric departments (5.5% vs. 3.4%) ($p < 0.01$). Also, at Sacco Hospital, the percentage of patients who abandoned the ED or refused hospitalization decreased significantly in 2020 (15.2% vs. 10%, $p < 0.01$). On the other hand, we observed a non statistically significant increase in discharged patients at FBF Hospital in 2020 compared to 2019, along with a reduction in the percentage of patients hospitalized in non-psychiatric facilities. Of note, the outcomes of EDs visits were significantly different between Sacco and FBF Hospital in 2020 ($p < 0.05$). Finally, the percentage of Covid-19 positive patients

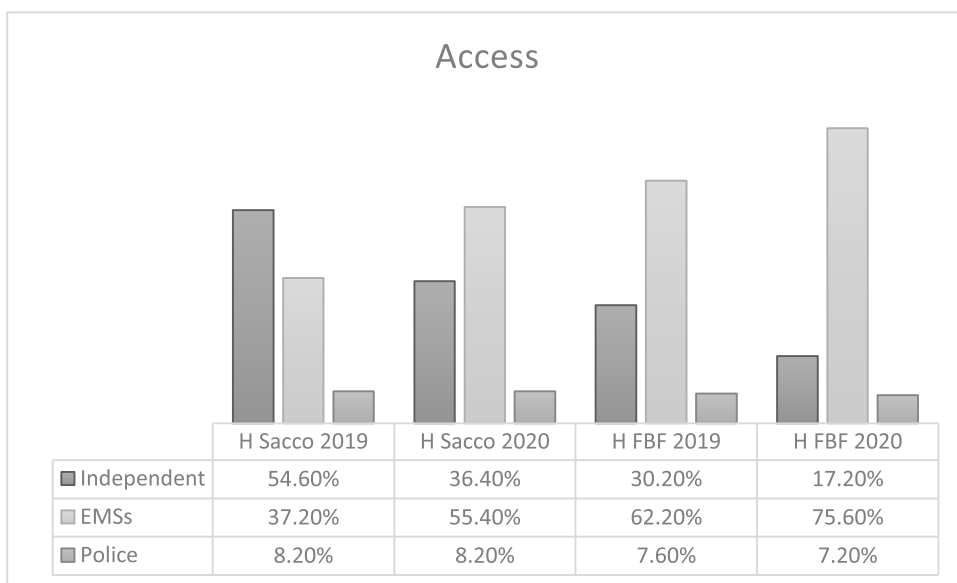


Fig. 1. Modes of access to the EDs
 Legend: EMSs, Emergency Medical Services; H Sacco, Luigi Sacco Hospital; H FBF, Fatebenefratelli Hospital. We can observe a significant reduction of independent visits to the EDs in 2020 compared to 2019 and an increment of EMSs transported patients in the same period (****, $p < 0.0001$). While this increment is conspicuous for FBF Hospital (****, $p < 0.0001$), it remains less significant for Sacco Hospital (***, $p < 0.001$).

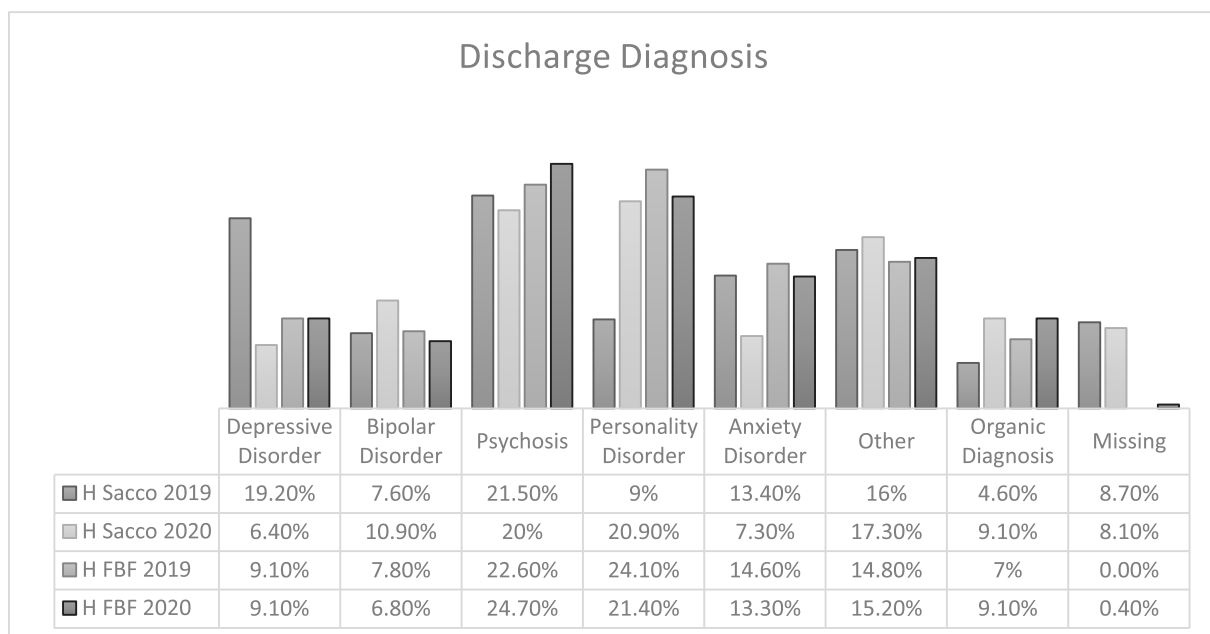


Fig. 2. Discharge Diagnosis
 Legend: H Sacco, Luigi Sacco Hospital; H FBF, Fatebenefratelli Hospital; Other, other psychiatric diagnosis. We can observe a significant difference between main diagnosis at discharge at Sacco Hospital between 2019 and 2020 (****, $p < 0.001$), specifically a reduction of Depressive Disorders and Anxiety Disorders and an increment of Personality Disorders and Organic diagnosis requiring a psychiatric evaluation. Of note, no difference can be found between diagnostic trends at Fatebenefratelli Hospital in 2019 and 2020 ($p = 0.87$).

evaluated at Sacco Hospital and at FBF Hospital in 2020 was significantly different (10% vs. 0.9%, $p < 0.0001$).

4. Discussion

In this study, we compared socio-demographic and clinical characteristics of patients who were taken in charge for a psychiatric evaluation at the EDs of two main hospitals in Milan, “Luigi Sacco” Hospital and “Fatebenefratelli” Hospital, during the periods of March, April and May 2019 and 2020. The main aim of this comparison was to analyse whether and how the SARS-CoV-2 pandemic had a short-term influence on the access to psychiatric services in Milan, one of the most affected

cities in Italy from the pandemic. Even though many factors could influence accesses to the EDs of the two analysed hospitals, such as territorial distribution of patients, quality of EDs services, logistical difficulties in reaching the hospitals, these factors are stable in the two analysed periods, validating the hypothesis that changes between the two periods could derive from the pandemic.

The number of EDs evaluated patients during the analysed trimester has been significantly lower compared to the same period of the previous year. This finding could depend on many factors, including, but not limiting to, the fear of contagion and the difficulties in accessing health services during the emergency, which might have influenced patients and their needs for medical assistance. Indeed, Sacco Hospital’s EDs

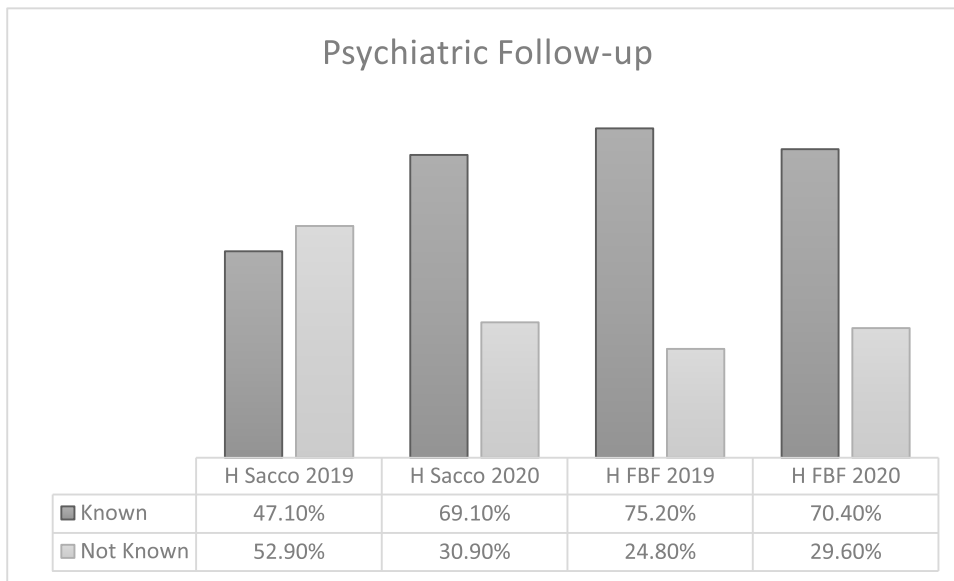


Fig. 3. Presence of a positive Psychiatric Follow-up
 Legend: H Sacco, Luigi Sacco Hospital; H FBF, Fatebenefratelli Hospital. We observed a significant difference between the percentage of known patients who accessed the ED of Sacco Hospital during 2019 and 2020 (****, $p < 0.0001$); of note, no significant difference can be found between the presence of a psychiatric follow-up in patients evaluated at the EDs of Sacco and FBF hospitals in 2020, while we can observe a non statistically significant reduction in the percentage of known patients evaluated at the ED of FBF hospital between 2019 and 2020.

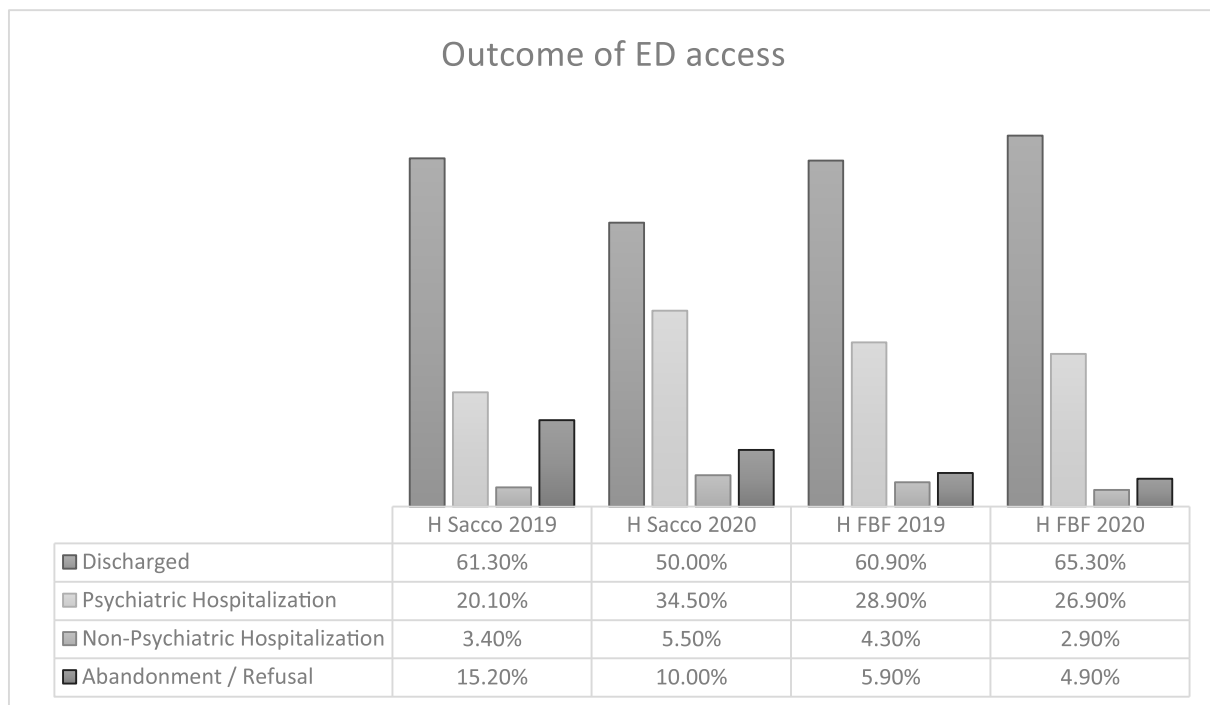


Fig. 4. Outcomes of ED access
 Legend: H Sacco, Luigi Sacco Hospital; H FBF, Fatebenefratelli Hospital. We can observe a significant difference between the outcomes of ED visits at Sacco Hospital in 2020 and the ones occurred at Sacco Hospital in 2019 (**, $p < 0.01$) and at FBF Hospital in 2020 (*, $p < 0.5$). In particular, we can observe a reduction in the percentage of discharged patients, along with an increment in both psychiatric and non-psychiatric hospitalizations.

accesses revealed a greater reduction than FBF Hospital: in this regard, the main difference between the two evaluated EDs and, therefore, hospitals, is their involvement in the management of COVID-19 patients. In fact, the Sacco Hospital has been one of the few chosen hub for the management of the pandemic in Italy, and even though psychiatric services in the hospital continued to work as usual, other aspects of the hospital could influence accesses to these services. For instance, the ED was often at its maximum capacity, and EMSs received instructions to bring psychiatric patients to other hospitals. Another reason that could have affected accesses to its ED lies in the generalized perception, fuelled also by social media, that Sacco Hospital had become an at-risk

place given the high number of infected patients treated there. Moreover, patients' difficulties inherent not only to the fear of contagion but also to the fear for the imposed restrictions (i.e. lockdown) and the fear of referring to EMSs, could have influenced the number of patients accessing the EDs. Indeed some studies reported a reduced number of psychiatric EDs evaluations during the pandemic in other foreign hospitals (Hoyer et al., 2020) and, more generally, other reports observed a reduced number of visits to the ED for non-COVID-19 related symptoms (Mantica et al., 2020). Even though, for the Sacco Hospital, both the number of patients independently accessing the ED and the ones brought there by EMSs showed a reduction, supporting both abovementioned

hypotheses, the percentage of patients brought to the ED by EMSs decreased less than the ones independently accessing the ED. These data could support the hypothesis that patients' and logistical difficulties could have influenced more accesses to the EDs than difficulties related to medical services. On the other hand, the percentage of patients brought by EMSs to the ED of FBF Hospital in 2020 was higher than the one of 2019 and the one referring to the ED of Sacco Hospital in 2020, supporting the hypothesis that EMSs were directed to its ED for medical pandemic-related reasons. Moreover, the percentage of previously known patients visited in the ED of FBF Hospital in 2020 was lower compared to the same period of the previous year, supporting the hypothesis that patients that usually referred to other hospitals were brought to FBF by EMSs due to the overload of other EDs. In the same perspective, the percentage of previously known patients who accessed the ED of Sacco Hospital in 2020 was significantly higher than in 2019, suggesting that only patients with psychiatric disorders and a well-structured follow-up history in that facility independently accessed the ED or were sent there from territorial services. On the other hand, the pandemic itself could have had an influence in the manifestation and the onset of psychiatric diseases, influencing the number of patients needing a psychiatric evaluation. In this regard, many studies in literature prospectively investigated an increment in the number of psychiatric diagnosis in the aftermath of the pandemic (Torales et al., 2020; Vieta et al., 2020; Yahya et al., 2020), focusing on what could be the long-term consequences of the ongoing emergency, but no studies available in literature analysed the impact of the ongoing pandemic on psychiatric services. In fact even though some reports documented the onset of certain psychiatric disorders, especially in the psychotic spectrum, related to SARS-CoV-2 infection (Chacko et al., 2020; Ferrando et al., 2020; Lim et al., 2020; Smith et al., 2020), the psychological and social impact of the pandemic on psychiatric patients could largely vary in relation to diagnosis, social and family support, and individual perception of risks and dangers. In this regard, our results show a significant difference in the discharge diagnosis of patients evaluated at Sacco Hospital in 2020 compared to 2019. The main difference lies in the reduction of Depressive and Anxiety Disorders, along with increased diagnosis of Personality Disorders. This result highlights how, in the short-term, the pandemic and the consequent restrictions imposed by the government had a higher impact on people experiencing social and psychological difficulties rather than on the onset and recurrence of psychiatric disorders. On the other hand, the percentage of patients accessing the ED for organic diseases and in need of a psychiatric evaluation increased at Sacco Hospital in 2020, suggesting that SARS-CoV-2 infection could directly and indirectly influence the mental health of positive patients. In line with the increased rate of patients suffering from organic diagnoses, the percentage of COVID-19 patients requiring a psychiatric evaluation was significantly higher at Sacco than FBF Hospital. Of note, we did not find any difference between the percentages of patients needing a psychiatric evaluation for Substance Use related Disorders, in contrast with some reports indicating an impact of the pandemic on addicted patients (Dubey et al., 2020). Moreover, we found a higher percentage of patients who attempted suicide requiring an ED evaluation at Sacco Hospital in 2019 compared to the same period of 2020 as well as to FBF Hospital both in 2019 and 2020. Even though this difference could depend from social and economic differences in the population afferent to the two different hospitals, the reduced number of suicide attempts (SAs) evaluated at Sacco Hospital in 2020 could be a direct consequence of the involvement of the hospital in the management of the pandemic: in fact, the hospital could not grant an observation period or ICU support to covid-negative patients. However, several reports have stressed the negative effect of the pandemic on the suicide risk in the population (Gunnell et al., 2020; McIntyre and Lee, 2020; Sher, 2020): considering the short-term focus of this study, our results do not give us any clue on the possible trends of suicide rates related to the pandemic. Ultimately, the percentage of discharged patients was lower at Sacco Hospital in 2020, and higher at FBF Hospital, confirming the

role of the latter in taking the place of other EDs in the care of non urgent or emergent conditions. Consistent with this hypothesis, the percentage of patients who were hospitalized in non-psychiatric departments after the ED visit was significantly higher at Sacco Hospital in 2020. On the other hand, psychiatric hospitalizations increased at Sacco Hospital in 2020. This last result sheds light on the possibility that, given the ongoing pandemic, many non-emergent situations have been managed through other channels (i.e. territorial facilities, outpatient visits, tele-psychiatric and psychological support), and only truly urgent and emergent conditions were sent to the attention of the ED.

Overall, the hypothesis that the overlap of organic and psychiatric emergency services brings significant distress to psychiatric patients gains ground, and will continue to do so in the face of new pandemic waves, especially for hospitals considered as infectious diseases hubs. One of the major areas impacted by the pandemic has been the possibility to grant continuity to psychiatric patients, for whom a therapeutic relationship with physicians is crucial in the maintenance and efficacy of treatments. Moreover, patients referring to different physicians can be less willing to give an accurate clinical history, or can simply not know which pharmacological therapy they use to assume. In order to overcome these possible interruptions in the continuity of psychiatric care during health emergencies, the different psychiatric departments covering the same area could improve their communication methods, such as to allow medical records to be more promptly shared between the different physicians that can participate in the care of psychiatric patients.

Our study aims to provide a picture of the short-term impact of the SARS-CoV-2 pandemic on the psychiatric EDs visits of two main hospitals of Milan. Overall, we observed a reduction of EDs accesses in 2020 compared to 2019, a result that may be due to a reduced attitude of patients to turn to hospital services, caused by the fear of contagion and to the overload of work in the EDs, leading the EMSs to direct patients to different facilities. Moreover, the differences found in the diagnosis at discharge between 2019 and 2020 suggest that psychological and social stressors had a higher and faster impact on subjects suffering from Personality Disorders.

Even though our study is one of few, if any, evaluating socio-demographic and clinical aspects of patients accessing the ED during the SARS-CoV-2 pandemic, the three-months period analysed here focuses only on the possible short-term impact of the emergency, and therefore no speculation can be made on the possible increment of psychiatric onsets and manifestations predicted by several reports in literature and related to the long-term exposure to the social, psychological and economic stressors people are facing, nor to the direct exposure to the virus. Moreover, patients taken in care by the two evaluated hospitals can differ from a socio-economic perspective, and therefore the comparison between the two samples could suffer a population bias, even though analysing both the 2019 and 2020 samples could reduce differences in this respect. Another factor to take into consideration is the closure of many psychiatric wards of the city during the pandemic because of COVID-19 cases: the number of patients in need of a psychiatric evaluation may have been distributed in fewer hospitals than the usual amount of accessible services. On the other hand, a limitation of this study lies in the choice of analysing accesses in only two hospitals of the city, even though these two specific hospitals belong to the same Department of Mental Health and communicate more in order to handle the distribution of patients.

In conclusion, our study found many differences in the accesses to the EDs of psychiatric patients during the pandemic. Even though our model is not able to give clear reasons for these differences, many hypotheses can be made, and further studies are needed on the subject in order to understand which factors can be changed in order to provide better care to psychiatric patients during emergency settings such as a pandemic.

Authors statement contributors

Author BD, FD and CM designed the study. Authors EP, LF and SR contributed to data collection. Author RC managed the statistical analyses and wrote the first draft of the manuscript. Authors RC, FD and BD produced the final draft of the manuscript, and authors BD, CV and CM revised the manuscript. All authors contributed to and have approved the final manuscript.

Competing interests

In the last three years, Dr Dell'Osso has received lecture honoraria from Angelini, Lundbeck, Janssen, Pfizer, Neuraxpharm, Arcapharma and Livanova; Dr Viganò has received lecture honoraria from Angelini, Lundbeck/Otsuka and Gilead; Dr Mencacci has received lecture honoraria from Lundbeck, Janssen, GSK, Recordati, Italfarmaco, Ecupharma. Dr Cafaro, Piccoli, Ferrara, Russo and Dragogna report no financial relationships with commercial interests.

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