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Effects of lockdown on emergency room admissions for psychiatric evaluation: an observational study from the AUSL Romagna, Italy

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ABSTRACT

Objectives: An observation of the admissions to the emergency room (ER) requiring psychiatric evaluation during the lockdown and investigation of the demographic and clinical variables.

Methods: Retrospective longitudinal observational study of ER accesses for psychiatric evaluation was performed, comparing two periods (9 March–3 May 2020 vs. 9 March–3 May 2019). Data (number of admissions, key baseline demographic and clinical variables) were extracted from the ER databases of referral centres in a well-defined geographic area of North-Eastern Italy (Cesena, Ravenna, Forlì, and Rimini).

Results: A 15% reduction of psychiatric referrals was observed, together with a 17% reduction in the total number of patients referring to the ER. This reduction was most evident in the first month of the lockdown period (almost 25% reduction of both referrals and patients). Female gender (OR: 1.52; 95% CI: 1.12–2.06) and being a local resident (OR: 1.54; 95% CI: 1.02–2.34) were factors associated with the decrease.

Conclusions: Lockdown changed dramatically health priorities in the local population, including people with mental health. We speculate that our observations do not only refer to the confinement due to the lockdown regime but also to fear of contagion and adoption of different coping strategies, especially in women.

KEY-POINTS

- During lockdown 15% reduction of psychiatric visits and >17% reduction in the number of psychiatric patients referring to the ER was observed.
- in the first four weeks of the lockdown almost 25% reduction of both visits and patients was observed
- Female gender and being a local resident were factors associated with the decrease.

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Lockdown; outbreak; pandemic; COVID-19; mental health; consultation

Introduction

The ongoing COVID-19 outbreak was first confirmed to have spread to Italy on 31 January 2020, when two Chinese tourists in Rome were tested positive for the virus. A cluster of cases was later detected, starting with 16 confirmed cases in Lombardy on 21 February (Anzolin and Amante 2020), and 60 additional cases and the first deaths on 22 February. By the beginning of March, the virus was spreading to all the regions of Italy.

Between 9 March and 3 May 2020, the Italian Government imposed a national lockdown, restricting the movements of the population except for certified needs such as work and health circumstances, in response to the growing pandemic of COVID-19 in the country and world-wide. Additional lockdown restrictions included the temporary closure of non-essential services, productive activities and businesses – the so-called ‘phase one’.

A recent systematic review of the literature (Brooks et al. 2020) has underlined the negative psychological effects of lockdown, such as the increased incidence of anxiety, depression and post-traumatic stress disorder (PTSD) symptoms, e.g., confusion and anger. Stressful factors were identified, including quarantine length >10 days, fear to contract the infection, boredom and frustration for forced inactivity, fear for shortness of essential elements of survival (food, water, clothes) especially in case of further prolongation of the institution. A recent survey carried out in China (Sun et al. 2020) found that the prevalence of PTSD in the population in mainland China, one month after the COVID-19 outbreak, was 4.6%. The presence of psychopathological complaints seems correlated with anxiety and anger during and after the lockdown (Jeong et al. 2016).

Access to the emergency room (ER) is considered an index of severe psychiatric distress since it underlines a compelling request

due to the patient's discomfort. Surprisingly, in contrast with the *a priori* hypothesis supported by research on lockdown, recent reports from Italy, France, Germany, Portugal, China and the United Kingdom studying the impact of the COVID-19 quarantine found a decrease in psychiatric ER visits (Alamia et al. 2020; Gonçalves-Pinho et al. 2020; Hoyer et al. 2020; Pignon et al. 2020; Saponaro et al. 2020), psychiatric ward admissions (Clerici et al. 2020) and other ER non-psychiatric visits (Cao et al. 2020; Thornton 2020).

On this background, the aim of our study was to compare the socio-demographic and clinical characteristics of patients admitted to the ER requiring psychiatric evaluation in a large area of the region Emilia-Romagna, North-Eastern Italy, during the 'phase one' of the restrictions for the COVID-19 outbreak (from 9 March to 3 May 2020) with those of the same period of the year 2019. A further analysis also focussed on the comparison between admissions in the first and the second period of lockdown (from 9 March to 3 April 2020 and from 4 April to 3 May 2020, respectively), to evaluate the fluctuations within the course of the lockdown.

Methods

Population

Retrospective longitudinal observational study of ER admissions leading to psychiatric assessment. Mental health facilities of the following neighbouring towns were involved: Cesena, Ravenna, Forlì, and Rimini. These services have the same organisation as the emergency department and are part of the same Local Health Unit (Azienda-Unità Sanitaria Locale della Romagna, AUSL Romagna), with a catchment area of 951,080 adult inhabitants, distributed as follows in the four districts: Cesena, 176,232; Ravenna, 331,151; Forlì, 156,884; Rimini 286,813.

Emilia-Romagna was one of the most afflicted Italian regions since the earliest stages of the COVID-19 epidemics, with a total of 26,175 cases and 3666 deaths at the end of the study period. In this area, 18,951 (2.0%) individuals were already in care at community mental health centres (Saponaro et al. 2020). We hypothesised that at an early stage, worries about the contagion and new coping strategies to face severe adverse events may prevail, while the prolongation of lockdown may increase boredom and frustration for imposed limitations to usual activities and fear for the worsening of the socio-economic situation. Moreover, for the same reasons, also the demographic and clinical characteristics of the sample could change.

Measures

The electronic databases of the four services were searched for the following data: sociodemographic variables (age, gender, ethnicity, marital status, housing status), positive history for medical comorbidities, reason for ER admission, psychiatric diagnosis at discharge and measures taken by the caring psychiatrist (hospitalization in psychiatric ward, other), extracted from open text in the electronic record.

The study was approved by the local ethics committee on 12 May 2020. A consent form was not required, since all the data were collected anonymously to allow statistical elaboration and were managed in aggregate form to avoid patients' identification.

Statistical analysis

All relevant variables were included in a general database and analysed by using the SPSS 16.0 software. Basic descriptive statistics were performed, with continuous variables presented as absolute numbers (N), mean, standard deviation (SD) and categorical variables as frequencies and percentages.

The sample was divided into two groups: variables related to the lockdown period (9 March–3 May 2020) and variables related to the control period (9 March–3 May 2019). Further on, variables related to the first half of the lockdown period (9 March–3 April 2020) were compared to those of the second half (4 April–3 May 2020). A Poisson distribution was assumed for the total number of visits/patients. The total number of visits/patients was compared between periods using a z-test (normal approximation for the Poisson distribution).

The association between each variable and the period was tested using the chi-square or the Fisher's exact test. All variables found to be statistically significant in univariate analyses and with a missing rate <20% were included in a multivariable binary logistic regression model. Results are reported as odds ratios (OR) with 95% confidence intervals (95% CI). The significance level was set at 5%.

Results

Considering the whole duration of lockdown, a decrease of 14.5% of psychiatric assessments ($p=0.02$) and of 16.8% of individuals ($p=0.01$) was observed. The difference was more pronounced in the first half of the lockdown, with a 24.8% decrease in both the number of assessments ($p<0.01$) and individuals ($p=0.01$) referring to the ER (Table 1).

Table 1. Number of psychiatric assessments and individuals assessed during the lockdown vs. control period.

City area	Whole lockdown (9 March–3 May 2020)		Whole control period (9 March–3 May 2019)		Decrease (%)		<i>p</i> -value (z-test)	
	<i>N</i> visits	<i>N</i> patients	<i>N</i> visits	<i>N</i> patients	Visits	Patients	Visits	Patients
Cesena	81	77	97	77	16.5	0	0.2304	1.0000
Ravenna	146	111	157	139	7	20.1	0.5274	0.0766
Forlì	68	55	75	63	9.3	12.7	0.5583	0.4615
Rimini	94	85	126	115	25.4	26.1	0.0310	0.0339
AUSL Romagna	389	328	455	394	14.5	16.8	0.0231	0.0140
City area	First half of lockdown (9 March–3 April 2020)		Control period (9 March–3 April 2020)		Decrease (%)		<i>p</i> -value (z-test)	
	<i>N</i> visits	<i>N</i> patients	<i>N</i> visits	<i>N</i> patients	Visits	Patients	Visits	Patients
Cesena	32	32	46	35	30.5	8.6	0.1129	0.7140
Ravenna	65	50	73	64	11	21.9	0.4959	0.1898
Forlì	28	28	34	31	17.6	9.7	0.4461	0.6961
Rimini	39	34	65	60	40	43.3	0.0108	0.0073
AUSL Romagna	164	144	218	190	24.8	24.2	0.0057	0.0118

Bold values to emphasize the significant *p* values.

Table 2. Comparison of features of patients'visits assessed during the whole lockdown and the whole control period.

Variable	Whole lockdown		Whole control period		Significance (<i>p</i>)
	N	%	N	%	
Age range (years)					<i>p</i> = 0.149
<18	10	2.6	18	4.0	
18–30	98	25.2	104	22.9	
31–45	96	24.7	116	25.5	
46–65	117	30.1	162	35.6	
66–80	51	13.1	39	8.6	
>80	17	4.4	16	3.5	
Gender					<i>p</i> < 0.001
Male	220	56.6	201	44.2	
Female	169	43.4	254	55.8	
Marital status					<i>p</i> = 0.758
Single	188	57.0	213	57.9	
Married/cohabitant	91	27.6	95	25.8	
Divorced	36	10.9	47	12.8	
Widowed	15	4.5	13	3.5	
Ethnicity					<i>p</i> = 0.014
Italian	335	86.6	364	80.2	
Foreign	52	13.4	90	19.8	
Occupation					<i>p</i> = 0.028
Self-employed	4	1.3	12	3.7	
Blue collar	41	13.4	54	16.7	
White collar	23	7.5	17	5.2	
Retired	57	18.7	45	13.9	
Disabled	27	8.9	40	12.3	
Unemployed/housewife	135	44.3	127	39.2	
Student	18	5.9	29	9.0	
Housing status					<i>p</i> = 0.002
Alone	71	20.4	56	14.6	
Family of origin	128	36.8	141	36.7	
Acquired family	95	27.3	113	29.4	
Therapeutic centre	28	8.0	62	16.1	
Homeless	11	3.2	5	1.3	
Other	14	4.0	6	1.6	
Comorbidity					<i>p</i> = 0.079
No	225	62.7	289	68.6	
Yes	134	37.3	132	31.4	
In psychiatric care					<i>p</i> = 0.533
Current	215	55.3	259	56.9	
Past	75	19.3	79	17.4	
Never	99	25.4	117	25.7	
ER admission reason					<i>p</i> < 0.001
Suicide ideation/self-harm/ suicide attempt	76	20.6	67	15.6	
Psychomotor agitation/intoxication/confusion	160	43.4	141	32.9	
Manic-psychotic episode	31	8.4	39	9.1	
Depression/anxiety symptoms	100	27.1	175	40.8	
Psychiatric diagnosis					<i>p</i> = 0.032
Psycho-organic disorder	31	8.1	17	3.7	
Psychotic disorder	48	12.5	79	17.4	
Mood disorder	78	20.3	89	19.6	
Anxiety disorder	30	7.8	44	9.7	
Personality disorder	49	12.7	70	15.4	
Intellectual disability	6	1.6	4	0.9	
Addiction disorder	31	8.1	37	8.1	
Adjustment disorder	62	16.1	56	12.3	
Eating disorders	1	0.3	6	1.3	
Dual diagnosis	43	11.2	47	10.3	
Psychiatric ward admission					<i>p</i> = 0.036
Yes	108	27.8	98	24.4	
No	281	72.2	357	75.6	

Comparison between lockdown period (9 March–3 May 2020) and corresponding antecedent period (9 March–3 May 2019)

Table 2 displays the comparison of variables referring to the two time periods, outlining some statistically significant changes. These were included in the subsequent logistic regression multivariate model, and only male gender (OR: 1.52; 95%CI: 1.12–2.06) and Italian ethnicity (OR: 1.54; 95%CI: 1.02–2.34) remained statistically significant.

Comparison between second (4 April–3 May 2020) and first (9 March–3 April 2020) phase of lockdown

At univariate analysis, a significant increase was observed in admissions for the female gender (54.9% vs 45.8%; *p* = 0.032), depression/anxiety symptoms (46.6% vs 26.7%; *p* = 0.001) and a diagnosis of psychosis (16.5 vs 11.2%; *p* = 0.034) and, in contrast, a significant decrease was found for diagnosis of psycho-organic disorders (4.2% vs 9.9%; *p* = 0.034), and agitation/intoxication/confusion (30.9% vs

46.2%; $p = 0.001$). Also, admissions to psychiatric wards decreased (20.3% vs 29.8%; $p = 0.018$).

Discussion

The aim of the present study was to measure changes in the incidence and features of psychiatric assessments performed in the ER during the COVID-19 lockdown, in March-April 2020, in 4 city districts of the north of Italy, as compared to those of the corresponding time lapse during 2019.

Consistently with current literature (Alamia et al. 2020; Gonçalves-Pinho et al. 2020; Hoyer et al. 2020; Pignon et al. 2020), we found a significant reduction in the numbers of both psychiatric assessments performed and individuals assessed. The decrease was even more evident in the first half of the lockdown, while, in the second half, numbers tended to re-align with those of the previous year.

Such findings could have several explanations. First of all, the indications of the Government to limit all kinds of movements of citizens, as in the definition of the lockdown regime: though urgent health needs were among the few consented reasons to leave one's house, it may be that some sort of 'different perception' of urgency activated, though not necessarily appropriate. Secondly, the fear of COVID-19 contagion: hospitals were by far places at highest risk of contact. Also, people may have found alternative coping strategies, as it is known to happen during severe community adverse events, such as wars. In a Danish study, a decrease in psychiatric admission rates was observed during the Nazi occupation compared to the period before the occupation, followed by a 50% increase just after the occupation, with a return to a flat level only after 3 years (Svendson 1953). Moreover, in line with similar findings (Clerici et al. 2020), patients and family members may have become more tolerant during the epidemic, avoiding referrals to hospital facilities.

This could explain the greater reduction numbers in the Rimini area, which reported the highest number of COVID-19 cases, with 2027 patients (0.71%) at the end of the lockdown, compared to 986 (0.30%) in Ravenna, 904 (0.58%) in Forlì and 685 (0.39%) in Cesena. Clerici et al. hypothesised that many emergency presentations, including intoxications and injuries, occur during social events, when alcohol and drugs are often consumed; thus, isolation may have significantly reduced this phenomenon. However, ER visits for intoxication or agitation did not reduce in our sample. Moreover, the attenuation of decrease in ER admissions in the second part of the lockdown could be correlated to the spreading of negative attitudes related to the avoidance of daily life activities and the worsening of the economic situation (Brooks et al. 2020). This could also explain the increased numbers of admissions for anxiety and depression, similarly to China, where an increase in PTSD symptoms was found (Sun et al. 2020). It should also be noticed that the reduced numbers here found could be underestimated, since in those days GPs were unavailable for routine visits due to government dispositions, and people had to refer to the ER for every medical problem (included mild psychiatric disorders), assuming that it was urgent.

Compared with the corresponding period in the antecedent year, during the lockdown period we found a greater decrease in the number of contacts with the ER services among women, in line with what elsewhere reported (Gonçalves-Pinho et al. 2020) but in contrast with other studies (Pignon et al. 2020). This finding might be due to better coping strategies of females, higher fear of contagion than in males if attending the ER, and higher diligence in applying the rules of the lockdown, as well as other

general rules, as explained by the lower rate of traffic rules violations (Taggi 2005).

The decrease of contacts among foreign people also deserves a comment. Foreign individuals in the area vary between 11% and 12% of the entire population (www.istat.it) and their number has slightly increased (1.7%) from 2019 to 2020. The foreign population accessing the ER for a psychiatric visit usually was in higher proportions than the local residents (almost double in 2019) because these individuals, if not officially recognised as Italian citizens, cannot receive elsewhere free-of-charge assistance. For this reason, foreigners are generally more prone to refer to the ER even for routine problems. This might explain why the percentage of foreign patients referring to the ER for psychiatric visits in the lockdown period was very close to the percentage of foreign people living in the area.

We found a non-significant decrease in diagnoses of psychoses, especially in the first phase of the lockdown, in contrast with other data (Gonçalves-Pinho et al. 2020), but in line with data following other significant periods of severe global distress like the second world war. Even if the comparison between a disease pandemic and a military war may not be always appropriate, a multicenter study found a significant decrease in admission rates for schizophrenia in the Second World War period compared to pre-war and post-war periods in Finland, Norway and Sweden (Dohan 1966), but a smaller decrease in Switzerland and Canada, which were basically out of the conflict, especially in the mainland. From a psychodynamic point of view, fragmentation anxiety, in this situation, finds its place in the 'outside world', relieving the inside world (Gabbard 2000). The persecutor is finally 'other than the self' (Gabbard 2000). Moreover, the lockdown regime may have had an attenuating effect on the experience of marginalisation of the patient with psychosis, who suddenly shares the same position as other people, even if in patients with schizophrenia, could be more vulnerable to the social isolation and lockdown measures (Gonçalves-Pinho et al. 2020).

We also found a decrease, though not significant, in admission rates for anxiety and depressive episodes, in line with others (Hoyer et al. 2020; Pignon et al. 2020), who hypothesised an impact of extended measures of social distancing on patients' willingness to seek help for mental health problems through in-hospital consultations. Our results also support the Stimulus-Organism-Response theory and the study conducted by Zheng et al. (2020), which found only moderate detrimental effects of pandemic severity on social anxiety. The increase of admission rates for psycho-organic disorders may be due to two reasons: the higher prevalence of people aged 66+ (17.5 vs 12.1) and the possible lack of caregivers due to the lockdown that can worsen the sense of loneliness in this specific population.

A non-significant increase in suicide attempt/suicidal ideation/self-harm as reasons to access the ER was counted, expressing experiences of discomfort and hopelessness during the lockdown, especially concerning the worsening of the economic situation.

Suicide attempt/suicidal ideation/self harm, psychomotor agitation, adjustment disorders were apparently unaffected, according to the multivariate analysis model. Compared to other psychiatric disorders, these clinical conditions might have important reflections on one's quality of life, to justify the request for urgent psychiatric consultation even in this critical period. This explanation can be offered also to interpret the lesser effects of the outbreak on psychiatric ward admission, that is in line with other authors (Gonçalves-Pinho et al. 2020), but in contrast with data from the same region (Saponaro et al. 2020).

Limitations

Our study has several limitations. First, the retrospective design could have led to biases in the collection of some variables, though retrieving of data was organised and performed systematically in the different sites, which are supported by the same electronic system of data-collection. Second, we have not a follow-up period to evaluate to which extent admission rates vary, especially in relation to the economic burden of the pandemic. Third, we focussed on psychiatric visits: in some cases, the same patient may have more than one admission and this could lead to an overestimation of some demographic variables. However, the number of repeated visits was small and it should not have influenced our results. Fourth, due to the fact that the ER database does not provide diagnoses following international classifications, such as ICD, we used descriptive psychiatric diagnoses formulated by the clinician, following clinical evaluation and using natural language. Fifth, the limited sample size may have prevented the identification of significant changes, especially for smaller subgroups, and the detection of any important associations. Finally, the study was performed in a local setting and, hence, generalizability of our findings may be limited: nevertheless, data collection in larger Italian samples applying the same methodology is ongoing, whose results will be presented in a separate report, and may deliver a wider and more comprehensive perspective of the clinical phenomena here discussed.

Conclusions

We found a significant reduction of ER psychiatric visits during the lockdown period compared to 2019, especially in the first half (March 2020). The reduction peaked among females and Italian citizens. The current study reflects early admission rates following the onset of the COVID-19 pandemic at an early stage. However, our results must be taken with cautiousness due to the fairly small sample and the retrospective design. Longitudinal studies are needed to investigate the pandemic sequelae on mental health in a longer period. Moreover, larger multicenter studies must be organised to verify whether these trends may be confirmed in other realities.

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Disclosure statement

No potential competing interest was reported by the authors

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