Table 1. Multivariate binary logistic regression analyses of variables predicting stress symptoms

		B	SE	d.f.	Sig.	Exp(B)	95%CI for Exp(B)	
							Lower	Upper
Step 1	Age	−0.041	0.015	1	0.006**	0.959	0.932	0.988
	Sex	0.562	0.274	1	0.040*	1.754	1.025	3.002
	Economic status	−0.217	0.097	1	0.025*	0.805	0.666	0.973
	Family history of mental disorder	0.756	0.298	1	0.011*	2.129	1.187	3.817
	BRS	−1.045	0.146	1	0.000**	0.352	0.264	0.468
	Psychological difficulties	0.904	0.502	1	0.072	2.471	0.923	6.613
	Constant	3.400	0.872	1	0.000	29.973		
Step 2	Age	−0.044	0.015	1	0.003**	0.957	0.929	0.986
	Sex	0.568	0.275	1	0.039*	1.766	1.030	3.027
	Economic status	−0.201	0.098	1	0.040*	0.818	0.675	0.991
	Family history of mental disorder	0.775	0.298	1	0.009**	2.171	1.210	3.896
	BRS	−1.024	0.147	1	0.000**	0.359	0.269	0.480
	Constant	3.281	0.878	1	0.000	26.603		

**P < 0.01.
*P < 0.05.
BRS, Brief Resilience Scale; CI, confidence interval.

other studies in which medical health workers with somatic disorders, female workers, and workers in contact with COVID-19 patients were at higher risk of insomnia, anxiety, obsessive–compulsive, and depressive symptoms,[10] we are aiming to present a more detailed analysis of protective factors in our future analyses.

Disclosure statement

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Pre/post comparison study of emergency mental health visits during the COVID-19 lockdown in Lombardy, Italy

Lombardy was the first and most severely affected Italian region to experience the COVID-19 pandemic.[1] A strict lockdown was enforced between 8 March and 3 May 2020, during which time public health authorities advised the population to limit their use of hospitals and emergency rooms (ER). Although previous evidence is lacking, patients with mental disorders may be less prone to comply with social distancing and preventive measures enforced during such a lockdown. Unlike the majority of other clinical services, mental health departments were required to continue their activity throughout the outbreak and to limit patients' access to hospitals through alternative outpatient interventions.[2]

We used a register-based, pre/post approach to examine the effectiveness of such efforts, as well as the compliance of patients with mental disorders to the instructions received. We chose the 8 March lockdown as our index event (T0) and compared emergency department visits for mental-health-related conditions at the San Paolo University Hospital in Milan, Italy during the lockdown (9 March–3 May 2020) and in the previous 2 months (13 January–8 March; i.e., 8 weeks before and after T0). We determined the percentage variation in the total number of ER visits and across subgroups, based on demographics, main diagnosis at discharge (clustered according to the DSM-5), and discharge destination (e.g., home, admission to the psychiatry ward). Finally, we used the number of psychiatric emergency visits during the same 16 weeks of the previous year (13 January–3 May 2019) as comparison. This was done to exclude the presence of habitual variations in ER visits during this time of the year that would in case be considered independent from the lockdown. Having clustered ages in three groups (18–29, 30–59, and 60+ years), all variables under study were compared using Pearson's χ^2-test with statistical significance set at $P < 0.05$. Approval for the purpose of this study was obtained from the hospital management.

Our data revealed a sharp reduction in psychiatric ER visits during lockdown compared to the previous 8 weeks. The total number of visits fell by 43%, from $n = 398$ pre-T0 to $n = 227$ post-T0 ($P < 0.001$). In the same period of the previous year, no difference could be observed in the number of ER visits before and after 8 March 2019 ($n = 393$ between 13 January and 8 March 2019, $n = 426$ between 9 March and 3 May 2019). This suggests that patients with mental health issues did comply with the request to limit ER use. As shown in Figure 1, however, the most notable drop in ER visits occurred 2 weeks prior to the lockdown, when the Ministry of Health issued recommendations to spontaneously restrict hospital access after the first Italian COVID-19 cases in Lombardy. A substantial reduction in ER use was maintained throughout the lockdown, although the number of visits increased approximately halfway towards pre-pandemic levels during the second month. This may reflect several possibilities, including a gradual loosening in patients' tendency to avoid hospitals and the emergence of COVID-19-related mental health issues.

After dividing ER visits into subgroups based on diagnosis at discharge, some differences may be observed among diagnostic categories. Overall, a significant decrease in ER visits after lockdown was observed for psychotic disorders (−46%, $P < 0.001$), mood disorders (−58%, $P < 0.001$), anxiety disorders (−49%, $P = 0.011$), and 'other' conditions (e.g., obsessive–compulsive disorder, neurocognitive disorders; −57%, $P < 0.001$). In particular, psychotic disorders comprised 21.4% of total ER visits pre-T0 and 20.3% post-T0; mood disorders, 16.3% and 11.9%, respectively; and anxiety disorders, 10.3% and 9.3%, respectively. For personality disorders, a statistical trend of decline was observed (−29%, $P = 0.066$), unlike that for alcohol- and substance-abuse disorders (−27%, $P = 0.297$) and, most notably, for trauma- and stressor-related disorders (−7%, $P = 0.785$). Indeed, the relative frequency of these three categories grew from 17.3% to 21.6% for personality disorders, from 6.5% to 8.4% for alcohol- and substance-abuse disorders, and from 7.0% to 11.5% for stressor-related disorders. Stress-related disorders reduced by only two cases after lockdown (28 to 26), despite total cases falling by 43%. We interpret this finding as preliminary evidence of an increase in these mental health emergencies related to the COVID-19 pandemic and lockdown. Personality disorders appear to represent the only group with limited compliance to restrictive measures. This might reflect a lower propensity to observe social norms and low frustration tolerance in the so-called Cluster B group of patients. Furthermore, the stability of substance-use disorder diagnoses might be explained by their frequent comorbidity with personality disorders on the one hand, and the possibility of self-medication attempts to cope with acute stress on the other. No significant differences in the reduction were found between subgroups based on sex ($P = 0.102$), age group ($P = 0.594$), or destination upon discharge from ER ($P = 0.742$).

Our findings should be considered preliminary and interpreted with caution due to the following limitations. First, data were collected in a
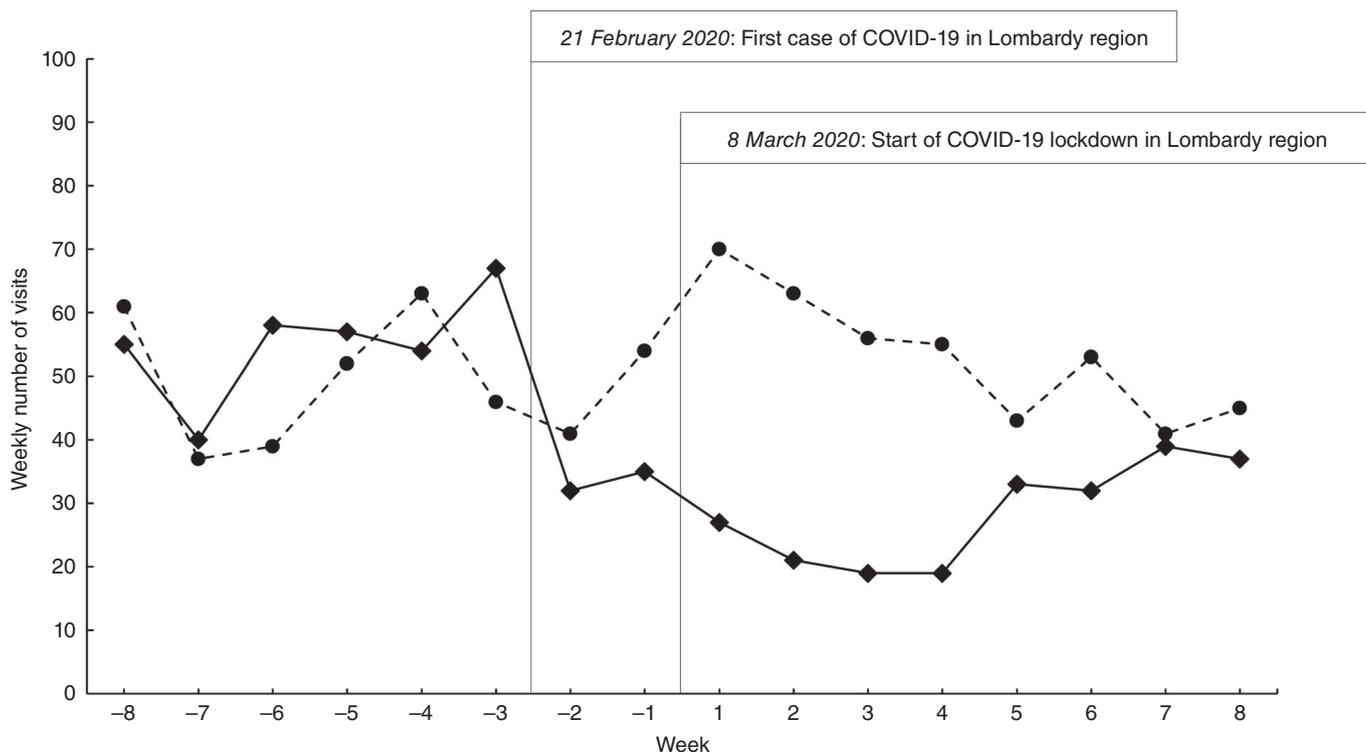

Fig.1 Weekly number of visits to the San Paolo Hospital emergency room (ER) due to a psychiatric condition between 13 January 2020 and 5 March 2020 (from 8 weeks before to 8 weeks after the COVID-19 lockdown start in Lombardy on 8 March 2020) and in the same time frame of 2019 (13 January–5 March 2019). Before 8 March, the weekly number of visits is comparable in the 2 years of observation ($n = 393$ in 2019, $n = 398$ in 2020); after 8 March, the number of ER visits is significantly lower in 2020 compared to 2019 ($n = 426$ in 2019, $n = 227$ in 2020; $P < 0.001$). (--●--) 2019. (—◆—) 2020.

single ER, so they might reflect characteristics of the catchment area rather than a general regional trend. However, our findings are in line with the reduction of hospital admission rates for psychiatric diagnoses reported by another four mental health departments in Lombardy.[3] Second, no information was available on patients with mental health issues who had reached the hospital with an overarching COVID-19-related medical problem. Third, the short period of observation might have masked substantial epidemiological phenomena that will be clarified in upcoming months. Indeed, further studies over longer time periods will be necessary to assess the effects of the COVID-19 pandemic and lockdown on mental health and mental health service use more extensively.

In conclusion, this study shows that: (i) ER visits for mental-health-related conditions were successfully reduced during lockdown by almost 50%; (ii) ER visits fell 2 weeks before lockdown, just as the Italian pandemic broke out, and began to rise again during the second month of lockdown; (iii) these variations in the number of ER visits are not observed in the corresponding period of 2019; and (iv) the decrease in ER use involved all diagnostic categories except for personality disorders, alcohol- and substance-abuse disorders, and particularly trauma- and stressor-related disorders.

Disclosure statement

The authors declare that there is no conflict of interest.

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Prolonged use of Internet and gaming among treatment seekers arising out of social restrictions related to COVID-19 pandemic

The novel coronavirus disease, COVID-19, originated in Wuhan, China, and has rapidly spread throughout the world. The World Health Organization declared the disease a pandemic on 11 March 2020. Prior to this, on 2 March, the Japanese government had requested local governments shut down elementary, and junior and senior high schools throughout the country. Other institutions, including colleges and universities, soon followed. On 7 April, the national government declared a state of emergency in selected prefectures and expanded this to all prefectures on 16 April. These measures were gradually lifted by the end of June.

During this state of emergency and the school closures, people were strongly recommended to stay at home and did so to a far higher degree than before the COVID-19 pandemic. Social restrictions, such as stay-home measures, would be expected to lead to an increase in the consumption of digital entertainment, particularly online gaming and related activities.[1] Currently, empirical data showing an increase in Internet use due to social restrictions are scarce, with the exception of a small number of very recent studies.[2,3] This study explored the possible impact of these restrictions on Internet use and gaming behavior among treatment seekers with gaming disorder (GD) or excessive use of Internet/gaming (EUIG). The latter are those who use the Internet or games excessively and have related problems but have not been diagnosed as having GD.

This study was approved by the ethics committee of our center (approval No. 361), and written informed consent was obtained from all study participants, with additional consent obtained from parents where subjects were under 18 years of age. Participants numbered 80 treatment seekers with GD or EUIG who visited our center between 16 May and 12 June 2020. Almost all were male (78/80), the mean age was 18.9 years (SD, 6.4 years; age range, 12–44 years), and about 70% were school students. Seventy percent of participants were diagnosed as having ICD-11 GD,[4] 20% engaged in excessive gaming but were not diagnosed as having GD, and the remaining 10% engaged in excessive use of other online applications.

Upon visiting our center, psychiatrists and clinical psychologists with expertise in the treatment of behavioral addictions conducted face-to-face interviews using an evaluation instrument developed for this study. It contained questions pertaining to changes in Internet use and gaming, functional impairment due to GD or EUIG, and possible reasons for the change. Participants were asked about changes in Internet use and gaming behavior and the level of functional impairment between February 2020 (pre-stay-home period) and the 30-day period prior to the survey (stay-home period). Internet use for study or work activities was excluded from Internet time for the purpose of this study. The data obtained were analyzed using SAS 9.4.[5]

Mean daily hours spent on the Internet, smartphones, online and off-line gaming, and video viewing were significantly higher for the stay-home period compared to the pre-stay-home period (Fig. 1). This was especially true for Internet and smartphone use and online gaming. Time spent on the Internet had increased between the two periods for 71.3% of participants, and 52.5% reported an increase in time spent on smartphones and online gaming. The most common reason for these increases appeared to be 'having extended free time to use the Internet and engage in gaming due to the stay-home measure.' In cases where individuals had a high number of social withdrawal days in February, there tended to be limited change in time spent on the Internet between the pre- and stay-home periods. In fact, repeated-measures analysis of variance revealed that participants who were socially withdrawn for fewer than 20 days showed a significant increase in time spent on the Internet, but for those who were socially withdrawn for 20 days or more, the time spent was unchanged. 'Social withdrawal' is a state in which an individual stays at home, does not go to school or work, and has no direct contact with people other than the family.

To better understand functional impairment due to GD or EUIG, we evaluated 10 problem areas (Table S1). Participants were asked whether each problem had worsened, was unchanged, or had improved between the pre-stay-home period and the stay-home period. There was a lack of uniformity in the responses. Compared to 'improved,' relatively higher rates of participants selected 'deteriorated' for social withdrawal, sleep disturbance, difficulty waking up in the morning, day–night reversal, and insufficient physical activity. In fact, the number of days of social withdrawal was significantly higher in the stay-home period than in the pre-stay-home period. Conversely, regarding the question of not studying at home, a relatively higher rate of participants responded with 'improved' compared to the rate for 'deteriorated.' This tendency was also true for participants who were socially withdrawn and did not go to school for 20 days or more in the pre-stay-home period, and whose situation remained unchanged at the survey