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Characteristics of Admissions to a Tertiary Psychiatric Hospital During the COVID-19 Pandemic: A Retrospective Observational Study

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ABSTRACT

Objectives: To study the effect of the COVID-19 pandemic on the socio-demographic and clinical profiles of patients who were admitted to a tertiary psychiatric hospital in the UAE during 2020 compared with the corresponding period in 2019, and to evaluate the effect of the pandemic on the mental healthcare system. ***Methods***: Socio-demographic and clinical data of the patients from March 11 to June 11 in 2019 and 2020 was collected anonymously from hospital electronic medical records. The characteristics of the two patient cohorts were compared statistically. ***Results:*** A total of 337 patient admissions to the hospital during March 11 to June 11, 2020 against 189 admissions in the corresponding period in 2019. In the multiple logistic regression model, the admissions in 2020 were significantly more likely to be diagnosed with bipolar disorder (odds ratio (OR) = 1.902; $p = 0.028$) and were significantly to have no prior psychiatric history (OR = 4.255, $p < 0.001$), compared to those cases admitted in 2019. ***Conclusions:*** This study is unique for evaluating the patterns of hospitalization at a specific psychiatric hospital during the first three months of the pandemic in the UAE. The findings of this study will support the public health sector in designing mental health strategies in pandemic situations. A longitudinal multicenter study would give more insight into the overall impact of the pandemic on mental health.

The first cases of the COVID-19 were reported to the World Health Organization (WHO) in December 2019 from Wuhan, China.[1] Since then, COVID-19 rapidly spread to other countries, and the WHO declared it a global pandemic on the 11th of March 2020.[1] The pandemic brought along unprecedented socio-economic challenges. Apart from the fear of contracting the virus, individuals globally faced a new reality that included working remotely, lockdowns, temporary unemployment, salary cuts, and travel restriction.[2]

Several studies have revealed the psychological impact of the COVID-19 pandemic. A meta-analysis of studies on the general population found elevated levels of anxiety and depression.[3] Another meta-analysis of studies among those who were infected by the virus found psychological problems including fear (47.6%), anxiety (16.6%), depression (37.7%), post-traumatic stress disorder (41.5%), insomnia (68.3%), and somatization (36.5%).[4] There is also evidence of neuropsychiatric manifestations among those who have contracted the virus.[5] In particular, new-onset psychosis has been described in some patients suffering from COVID-19.[6]

A few studies evaluated the trends in psychiatric hospitalizations during the pandemic. In Spain and the UK, the 'pandemic months' of 2020 saw increased hospitalizations with psychosis or mania compared to the same period in 2019.[6–8] An Australian study also reported higher rates of admission for psychotic and personality disorders.[9]

However, another UK study reported that admissions to mental health services found significantly fewer hospital admissions when considering the mental health services of acute adults and older people during the pandemic.[10] This was echoed by another study from Italy which found a reduction in all types of disorders studied (affective, personality, substance, and schizophrenia spectrum disorders) in the first 40 days of the 2020 lockdown compared to the same period in 2019.[11]

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The UAE is an Arabian country that consists of seven emirates and a total population of around 9.8 million most of whom are expatriates representing > 200 nationalities.[12] The first case of COVID-19 in the UAE was reported on 29 January 2020.[13] UAE has been one of the foremost countries to introduce stringent measures to control the spread of the virus. During the first months of the pandemic, the country responded effectively by organizing a nationwide sterilization campaign that began on 26 March and lasted until 24 June 2020.[14,15] Different safety and social distancing measures were applied to control and minimize crowding such as curfews and rules for remote work and education.[16]

Al Amal Psychiatric Hospital is a government-run tertiary mental health facility in Dubai with 168 beds. The hospital caters to the emirate of Dubai and the northern emirates (Ajman, Fujairah, Ras Al Khaimah, Sharjah, and Umm Al Quwain), where about 80% of the UAE population reside.[17] During the period of this study, all other inpatient psychiatric facilities in Dubai and the northern emirates were temporarily closed and all psychiatric admissions were diverted to Al Amal Psychiatric Hospital. The hospital took various infection control measures to reduce the risk of infection among patients and staff.

A previous study from the UAE (before the COVID-19 pandemic) had shown psychotic illnesses are the most common reason for admission in a psychiatric hospital.[18] The question of any change in the socio-demographic mix of psychiatric admissions during the pandemic has not been examined yet in the UAE, to our knowledge. Therefore, the aim of this study was to evaluate the characteristics of psychiatric admissions during the first three months of the COVID-19 pandemic compared to the same period in 2019, to understand the effect of the pandemic on the mental healthcare system.

METHODS

The patients included in this retrospective observational study were admitted to inpatient units at Al Amal Psychiatric Hospital during the period from 11 March to 11 June 2020, and the same period in 2019. We collected the patients' data in September 2020. Admissions due to primary substance misuse (the main reason for admission) were excluded from the study. However, patients with mood and psychotic disorders that were substance-induced were included. Ethical approval was obtained from Al Amal Psychiatric Hospital research committee and the Ministry of Health and Prevention (MOHAP) research ethics committee (reference number: MOHAP/DXB-REC/ JAA/ No.100 /2020).

The data was collected anonymously from the electronic medical records of the hospital (n = 189 in 2019 and n = 337 in 2020). For patients with multiple admissions, all admissions for the subject during the concerned time frame were included. The data obtained from the electronic medical records included sex, age, nationality, marital status, employment status, source of referral, previous psychiatric history, length of stay, and primary diagnosis as per the International Classification of Disease-10 (ICD-10).

First, descriptive analysis was performed to show percentages for categorical variables and the mean and SD for the quantitative variables for each of the 2019 and 2020 periods. Chi-square or Fisher's Exact tests were then carried out to compare the categorical variables across the two years. The quantitative variables were first analyzed with Shapiro-Wilk's test to check the normal distribution. The student *t*-test or the non-parametric Mann-Whitney U test was then used to compare the two time periods. Finally, a multivariate logistic regression model was created including all the variables with $p < 0.05$ in the initial comparison, along with sex and age. Admission during 2020 was designated as the dependent variable for the logistic regression model. Adjusted odds ratios (AORs) were reported along with their 95% CIs. Statistical analysis was performed using SPSS (IBM Corp. Released 2020. IBM SPSS Statistics for Windows, Version 27.0. Armonk, NY: IBM Corp.).

RESULTS

For the three-month period (11 March to 11 June), a total of 189 patients were admitted in 2019 compared to 337 in 2020. First, socio-demographic and clinical characteristics were compared across 2019 and 2020 patients with Pearson's chi-squared test for categorical variables and Mann-Whitney U test for numerical variables. Then, a multiple logistic regression model was created to find correlates of admissions in 2020.

With regards to socio-demographics, in 2020 significantly lower percentage of patients were UAE

nationals (25.8% vs. 40.7%; $\chi^2 = 12.570$; $p < 0.001$) or were unemployed (43.9% vs. 56.1%; $\chi^2 = 23.639$; $p < 0.001$), compared to 2019. No significant differences between the two years were observed for the other socio-demographic factors including age, sex, or marital status. Additional comparisons are presented in Appendix 1.

Regarding primary diagnosis trends, proportionately more patients in 2020 were diagnosed with bipolar disorder (24.9% vs. 14.3%; $\chi^2 = 8.234$; $p = 0.004$) and brief psychotic disorder (20.8% vs. 9.5%; $\chi^2 = 10.996$; $p = 0.001$). Meanwhile, there was a reduction in substance-induced disorders (psychosis and mood disorders) (11.3% vs. 23.3%; $\chi^2 = 13.261$; $p < 0.001$) and schizophrenia (12.8% vs. 22.2%; $\chi^2 = 8.003$; $p = 0.005$) in 2020 compared to 2019. No significant differences were observed for cases of major depressive disorder, schizoaffective disorder, or other conditions [Table 1].

For the other factors studied, the percentage of patients with no psychiatric history was significantly higher in 2020 than in 2019 (36.2% vs. 9.5%; $\chi^2 = 44.240$; $p < 0.001$). No significant difference in the length of stay at the hospital was observed. However, in 2020, relatively fewer patients were brought in by family/friends/ colleagues (55.5% vs. 66.7%; $\chi^2 = 27.342$; $p = 0.014$) in comparison to other types of referral [Table 1].

Looking at all categories of referral in more detail, there was also an overall significant difference ($\chi^2 = 27.300$; $p < 0.001$) where there were more patients in 2020 observed to have been brought in from other facilities (15.7% vs. 11.6%), by sponsors (11.3% vs. 4.2%), and through the police and ambulance (12.5% vs. 4.8%). The decrease from 2019 was as mentioned with regards to those being brought by family, friends, or colleagues (55.5% vs. 66.7%) and also patients who had referred themselves (4.5% vs. 11.1%).

Controlling for sex and age, the multivariate logistic regression showed that being diagnosed with bipolar disorder (OR = 1.902; $p = 0.028$) and not having a previous psychiatric history (OR = 4.255; $p < 0.001$) were significantly associated with admission in 2020 [Table 2].

Table 1: Comparison of psychiatric admissions across 2019 and 2020.

Variables	2019		2020		*p*-value
	n	%	n	%	
No of admissions	189	100	337	100	–
Socio-demographics					
Male patients[a]	126	66.7	207	61.4	0.231
UAE national[a]	77	40.7	87	25.8	<0.001*
Married[a]	54	28.6	113	33.5	0.200
Unemployed[a]	106	56.1	148	43.9	<0.001*
Primary diagnosis					
Bipolar disorder[a]	27	14.3	84	24.9	0.004*
Major depressive disorder[a]	14	7.4	27	8.0	0.804
Substance-induced mood/psychotic disorder[a]	44	23.3	38	11.3	<0.001*
Brief psychotic disorder[a]	18	9.5	70	20.8	0.001*
Schizoaffective disorder[a]	13	6.9	25	7.4	0.818
Schizophrenia[a]	42	22.2	43	12.8	0.005*
Other[a]	31	16.4	50	14.8	0.633
No previous psychiatric history[a]	18	9.5	122	36.2	<0.001*
Referral[a]					
Friend/family/colleague	126	66.7	187	55.5	0.014*
Other variables	**Mean**	**SD**	**Mean**	**SD**	
Age, years[b]	34.8	10.3	33.8	11.0	
Length of stay, days[b]	22.5	49.9	24.9	33.7	

[a]: Chi-square test; [b]: Mann-Whitney U test.
** Statistical significance since p-value is < 0.05.*

Table 2: Multiple logistic regression for odds of admission during 2020.

Variables	Adjusted odds ratio	95% CI		*p*-value
Socio-demographics				
Male patients	1.024	0.666	1.574	0.914
Age	0.994	0.976	1.013	0.529
UAE national	1.034	0.651	1.643	0.887
Unemployed	0.746	0.465	1.198	0.225
Primary diagnosis				
Bipolar disorder	1.902	1.073	3.369	0.028*
Substance-induced mood/psychotic disorder	0.570	0.302	1.077	0.084
Brief psychotic disorder	1.168	0.559	2.443	0.679
Schizophrenia	0.768	0.437	1.351	0.359
Previous psychiatric history				
No previous psychiatric history	4.255	2.294	7.874	<0.001*
Referral				
Friend/family/colleague	0.797	0.512	1.239	0.313

**Statistical significance since p-value is < 0.05.*

DISCUSSION

This is a retrospective study that examined the profiles of cases admitted to a psychiatric hospital from 11 March to 11 June 2020, the first three months after WHO declared COVID-19 a pandemic. This was then compared to psychiatric admissions during the corresponding months in 2019. To our knowledge, this is the first study of its kind from the UAE.

Results show an overall increase in the number of admissions during the selected three-month period of the pandemic (189 in 2019 vs. 337 in 2020). While there could be multiple and complex reasons for this increase, it is hypothesized to be partly because other facilities were closed for psychiatric admissions as part of the healthcare system's response to the pandemic.

A few studies from other countries have reported different trends for inpatient admissions. Studies from Spain and Australia showed a slight decrease in hospital psychiatric admissions,[6,9] whereas studies from the UK and Italy reported significant decreases primarily attributed to the avoidance of hospitals for fear of contamination.[7,8,10,11] It is important to also note that countries had varied responses to the pandemic and so caution should be applied when interpreting cross-country comparisons of changes in the rates and profiles of psychiatric hospitalizations. Methodological differences between studies are also to be taken into consideration.

Patients in our study who received inpatient treatment during the three-month study period in 2020 were comparable in terms of age, sex, and marital status to those in 2019. However, there was an over-representation of non-local patients—especially non-Arabs—in 2020 compared to 2019; non-local populations in other countries also experienced higher stress from the pandemic-related socio-economic disruptions. Even prior to the pandemic, stress-related disorders used to be higher among expatriates in the UAE.[18] There was also a decrease in the percent of patients who were unemployed, although its significance disappeared in the multi-logistic regression which incorporated other clinical and socio-demographic variables.

With regards to the clinical profiles of the patients admitted in 2020 versus 2019, an interesting finding was the significant increase in the proportion of patients with bipolar disorder and brief psychotic disorder. In the multiple logistic regression model, bipolar disorder remained significant (OR = 1.902) showing that regardless of the other characteristics in the model, bipolar disorder was associated with admission in 2020. This trend of an increase in the proportion of inpatients with psychosis or mania during the pandemic (due to the urgency of hospitalization) has also been reported from Spain, the UK, and Australia.[6–8,10] The decrease in substance-induced psychiatric conditions could be due to the

lower accessibility to psychotropic substances amidst lockdowns and enforced social distancing.

However, this change in the profile of admissions should not be assumed to reveal the overall mental health impact of the pandemic on the UAE population. One way to measure the psychological burden on the general population is through population-based surveys. However, with the pandemic nearly over, such surveys would now be subject to recall bias. More reliable (albeit limited) information may emerge from retrospective studies based on already recorded data such as outpatient consultations (including telepsychiatry) and the reported trends of mental health-related conditions (e.g., family violence) before and during the pandemic.

An interesting finding was the increased presentation of patients with no previous psychiatric history. Although the general closure of admissions to other mental health facilities could have contributed to that, this does not discount the possibility that psycho-social stressors brought by the pandemic may have had a role in increasing the likelihood of certain conditions.[19] Research shows that uncertainty is associated with psychiatric symptoms and the pandemic definitely caused uncertainty, especially during the first months.[20] It is also possible that some individuals with less resilience had been more susceptible to stress-related disorders with the start of the pandemic.

The following limitations have to be considered while interpreting the findings of this research. First, all our data was sourced from psychiatric admissions to a single tertiary care center, and that too, pertaining to a short timeframe of three months in 2020 and 2019. A more longitudinal, multicenter study would provide more insight into the overall impact of the pandemic on the mental healthcare system. Second, our study focused on the main reason for admission (primary diagnosis) without considering physical or psychiatric comorbidities. Third, the changes in hospitalization patterns during the pandemic might be attributable to complex and multifarious reasons (described above) beyond the scope of this study.

Despite these limitations, this study is unique in evaluating the patterns of psychiatric hospitalization at a specialized psychiatry hospital during the pandemic. Our results will add to the literature on this topic. The findings of this study should also help the public health sector in planning and designing mental health strategies at macro levels in future pandemic situations.

CONCLUSION

This is the first study to evaluate patterns of hospitalization at a specialized psychiatry hospital during the early phases of the COVID-19 pandemic in the UAE in 2020, compared with the corresponding period in 2019. Multiple logistic regression revealed that psychiatric admissions in the first three months of the pandemic had higher proportions of bipolar disorder diagnosis and cases with no prior psychiatric history compared to the previous year. These findings are attributed to multiple and complex reasons. The results of this study are expected to help in the creation of mental health response strategies in the case of future pandemic situations.

Disclosure

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Appendix 1

Table AI: Psychiatric admissions at Al Amal Psychiatric Hospital, Dubai, of various nationality groups 11 March to 11 June 2020 in comparison with the same period in 2019.

Year of admission	Americas/ Europe	Africa	Asia (not Arab)	Arab (not GCC)	Arab (GCC)	Total
2019						
No. of patients	6	10	39	56	78	189
Within 2019, %	3.2	5.3	20.6	29.6	41.3	
2020						
No. of patients	8	49	130	58	92	337
Within 2020, %	2.4	14.5	38.6	17.2	27.3	

$\chi^2 = 37.60; p < 0.001.$