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The impact of COVID-19 on emergency department presentations for mental health disorders in Queensland, Australia: A time series analysis

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Abstract

Background: The COVID-19 pandemic has been associated with detrimental effects on mental health and psychological well-being. Although multiple studies have shown decreases in mental health-related Emergency Department (ED) presentations early in the COVID-19 pandemic, the medium-term effects on mental health-related ED presentations have remained less clear. This study aimed to evaluate the effect of the pandemic on mental health ED presentations by comparing observed presentation numbers to predictions from pre-pandemic data.

Methods: This retrospective cohort study tallied weekly ED presentations associated with mental health disorders from a state-wide minimum dataset. Three time periods

were identified: Pre-Pandemic (January 1, 2018–March 8, 2020), Statewide Lockdown (March 9, 2020–June 28, 2020), and Restrictions Easing (June 29, 2020–June 27, 2021). Time series analysis was used to generate weekly presentation forecasts using pre-pandemic data. Observed presentation numbers were compared to these forecasts.

Results: Weekly presentation numbers were lower than predicted in 11 out of 16 weeks in the Statewide Lockdown period and 52 out of 52 weeks in the Restrictions Easing period. The largest decrease was seen for anxiety disorders (Statewide Lockdown: 76.8% of forecast; Restrictions Easing: 36.4% of forecast), while an increase was seen in presentations for eating disorders (Statewide Lockdown: 139.5% of forecast; Restrictions Easing: 194.4% of forecast).

Conclusions: Overall weekly mental health-related presentations across Queensland public EDs were lower than expected for the first 16 months of the COVID-19 pandemic. These findings underline the limitations of emergency department provision of mental health care and the importance of alternate care modalities in the pandemic context.

KEYWORDS
cohort studies; COVID-19; emergency service, hospital; mental health; pandemic

1 | INTRODUCTION

Following its initial outbreak in 2019, the coronavirus disease (COVID-19) pandemic spread rapidly, triggering the implementation of prolonged lockdowns, travel restrictions, and the closure of businesses, schools, and public services. This has raised concerns over adverse mental health consequences, including increased rates of anxiety and depression (Zavlis et al., 2022), suicidal ideation, post-traumatic stress symptoms, and insomnia (Chen et al., 2021). A 2020 United States study showed a rise in serious psychological distress from 3.9% of respondents pre-pandemic to 13.6% (McGinty et al., 2020). A review of past viral outbreaks noted an increase in psychological distress and mental health-related service activity (Bowman et al., 2021). Although data from the early months of the pandemic did not demonstrate an increase in rates of suicide (Australian Institute of Health and Welfare [AIHW], 2022b; Pirkis et al., 2021), prolonged psychological and economic distress could escalate suicide risks (Sinyor et al., 2021). Quarantine policies have notably worsened social isolation and psychosocial health, particularly amongst vulnerable groups such as the elderly (Chen et al., 2021).

However, data on Emergency Department (ED) presentations associated with mental illness during the pandemic shows mixed effects. The largest study, performed in the United States, found decreased ED presentations for mental health conditions in the early weeks of the pandemic, although suicide attempts and overdoses later increased above pre-pandemic levels (Holland et al., 2021). Several smaller studies have also found an early reduction in mental health presentations, with decreases ranging from 38% to 52% (Ferrando et al., 2021; Gómez-Ramiro et al., 2021; Goncalves-Pinho et al., 2021; Mukadam et al., 2021; Stein et al., 2020). These studies were limited by small sample sizes and short time periods of 90 days or fewer post-pandemic declaration, while representing jurisdictions with high COVID-19 case numbers and strict lockdowns. Studies covering longer periods in Connecticut, United States, and Istanbul, Turkey, also showed reductions of 28% over 6 months (Mitchell & Fuehrlein, 2021) and 12% over 10 months, respectively (Yalçın et al., 2021). Anderson et al. (2022) showed a decrease in mental health-related ED presentations of 5.4% in the period after a COVID-19 case peak compared to pre-pandemic, whereas mental health presentations decreased by 17.2% during the COVID-19 case peak. Pediatric mental health presentations also decreased early in the pandemic, but rose to pre-pandemic levels within 6 months (Leeb et al., 2020; McDonnell et al., 2021), with an eventual increase above pre-pandemic levels for all pediatric mental health presentations (Leeb et al., 2020), as well as presentations associated with suicidality (Edgcomb et al., 2021; Yard et al., 2021) and eating disorders (Chadi et al., 2021).

While many studies showed reduced ED presentations in the early months of the pandemic, few include later pandemic phases, which appear to demonstrate increases to above pre-pandemic levels. Furthermore, much of the published data are from areas with high rates of COVID-19 community transmission. The state of Queensland in Australia introduced strict public health measures in April 2020, including stay-at-home orders, business closures, and border restrictions (Queensland Government, 2020). COVID-19 case rates in Queensland remained extremely low (Queensland Government, 2022) and most restrictions on activities within the state were eased by July 2020, as Queensland entered Stage 3 of the Roadmap to Easing

Restrictions (Queensland Government, 2020). However, stringent border control measures remained in place, and further brief lockdowns occurred in January (Siganto, 2021) and March 2021 (Nothling, 2021) in response to locally acquired cases. Multiple further lockdowns were declared from June 2021 (Ruddick, 2021) onwards to control outbreaks of the Delta variant of SARS-CoV-2, followed by a rapid increase in cases from December 2021 onwards associated with the opening of borders and transmission of the Omicron variant (Queensland Government, 2022). This study aimed to evaluate the early- to middle-term effects of the pandemic on mental health ED presentations in Queensland from March 2020 to June 2021, covering the pre-Delta phase.

2 | METHODS

2.1 | Design, setting and sample

This was a retrospective cohort study. It took place in Queensland, Australia, a state with a population of ~5.2 million people as of September 2021 (Australian Bureau of Statistics [ABS], 2022). Emergency care is provided through both private and public hospitals and there is no cost to access ambulance services. The study population included all presentations to public hospital EDs aged five and over in Queensland with a mental health disease or disorder.

2.2 | Data collection

Data were obtained from the Queensland Emergency Data Collection (EDC), an administrative data collection detailing presentations to public hospital EDs throughout the State. Presentations associated with a mental disease or disorder were identified using the EDC data element: Principal Diagnosis. Details of this data extraction are described in Data S1–*Data Collection*.

2.3 | Data cleaning and categorization

Two-time points of interest were identified. The first was when the World Health Organization (WHO) declared COVID-19 as a pandemic on March 11, 2020 (Cucinotta & Vanelli, 2020). The second was when the Queensland Government entered Stage 3 of the Roadmap to easing restrictions on July 3, 2020, allowing private gatherings of up to 100 people and considerably reducing limitations on businesses (Roadmap to Easing Restrictions, Queensland Government, 2020). Mental health related patient presentations were tallied on a weekly basis. Based upon the above time points, three time periods were specified—pre-pandemic (PP), week 1 2018–week 10 2020 (January 1, 2018–March 8, 2020; 114 weeks), Statewide Lockdown (SL), week 11 2020–week 26 2020 (March 9, 2020–June 28, 2020; 16 weeks) and Restrictions Easing (RE), week 27 2020–week 25 2021 (June 29, 2020–June 27, 2021; 52 weeks).

Prespecified mental health diagnostic categories of interest included psychotic disorders, mood disorders, anxiety disorders, eating disorders and intentional self-harm. ICD-10-AM codes associated with these diagnostic categories are shown in Table S1.

2.4 | Data analysis

Routinely collected patient data, including demographics, ED presentation characteristics, and ED outcomes, were analyzed according to the time-period of presentation. Categorical data were presented as number and percentage of total, with statistical significance testing performed using the chi-squared test for comparison over all levels or logistic regression modeling for comparison of specific levels. Continuous data was presented as median and interquartile range (IQR), with statistical significance testing performed using median regression.

Expected weekly presentation numbers in the absence of the COVID-19 pandemic and associated lockdowns were forecast using time series analysis. Weekly presentation data from the pre-pandemic period (comprising 114 weeks) was used as training data. The forecast model optimization process is described in Data S1—*Forecast Model Optimization*.

Following model specification, the optimized time series model was used to forecast predicted ED mental health presentations for the remaining 68 weeks in the study period, including the Statewide Lockdown followed by Restrictions Easing periods, representing expected activity without the COVID-19 pandemic. Total forecast presentations for the Statewide Lockdown and Restrictions Easing periods were calculated and reported alongside observed presentations. Weekly 95% prediction intervals (PI) for forecast presentations were calculated, such that consistently observed values outside of these intervals indicates a statistically significant deviation from the forecast. Subgroup analysis was performed by age, sex, Aboriginal or Torres Strait Islander status, Australasian Triage Scale (ATS) category, arrival mode (self-presented, ambulance, or police/correctional services), and diagnostic category. The ATS is a marker of treatment urgency determined by the ED triage nurse, ranging from ATS 1 (requires immediate medical assessment and treatment) to ATS 5 (assessment and treatment within 120 min) (Australasian College for Emergency Medicine, 2013).

Data were cleaned and categorical analysis performed using Stata V17.0 (StataCorp, College Station, TX). Time series analyses were performed using R V4.1.2 (R Foundation for Statistical Computing, Vienna, Austria).

3 | RESULTS

Between January 1, 2018, and June 30, 2021, 185 450 mental-health related presentations to 105 public EDs were identified (Table 1). 115 889 ED patient presentations occurred during the Pre-Pandemic period, 17 379 during Statewide Lockdown and 52 182 during the Restrictions Easing period. Age was distributed similarly across the

TABLE 1 Demographic and ED characteristics, by time period, for mental health Presentations.

	Pre-pandemic	Statewide lockdown	Restrictions easing	Overall	*p*-value
Total	115 889	17 379	52 182	185 450	–
Age—median (IQR)	33 (21–46)	33 (22–47)	32 (21–46)	32 (21–46)	<0.001
Age group					<0.001
Pediatric (5–17)	16 895 (14.6%)	2396 (13.8%)	7896 (15.1%)	27 187 (14.7%)	
Adult (18–64)	90 255 (77.9%)	13 585 (78.2%)	40 524 (77.7%)	144 364 (77.8%)	
Older Adult (≥ 65)	8740 (7.5%)	1398 (8.0%)	3762 (7.2%)	13 899 (7.5%)	
Sex					<0.001
Male	54 209 (46.8%)	8165 (47.0%)	23 477 (45.0%)	85 851 (46.3%)	
Female	61 630 (53.2%)	9207 (53.0%)	28 644 (54.9%)	99 481 (53.6%)	
Indigenous status: Aboriginal or Torres Strait Islander	15 009 (13.1%)	2656 (15.4%)	7045 (13.6%)	24 712 (13.4%)	<0.001
Triage category[a]					<0.001
1	837 (0.7%)	118 (0.7%)	382 (0.7%)	1337 (0.7%)	
2	17 302 (14.9%)	2346 (13.5%)	8057 (15.4%)	27 704 (14.9%)	
3	61 742 (53.3%)	8635 (49.7%)	29 602 (56.7%)	99 979 (53.9%)	
4	28 857 (24.9%)	4463 (25.7%)	12 100 (23.2%)	45 420 (24.2%)	
5	7152 (6.2%)	1817 (10.5%)	2041 (3.9%)	11 010 (5.9%)	
Arrival mode					<0.001
Ambulance	52 866 (45.6%)	8030 (46.2%)	25 211 (48.3%)	86 107 (46.4%)	
Self-presented	49 982 (43.1%)	7804 (44.9%)	21 276 (40.8%)	79 060 (42.6%)	
Police or correctional services	11 643 (10.0%)	1356 (7.8%)	5165 (9.9%)	18 165 (9.8%)	
Diagnostic code					
Anxiety disorder	29 942 (25.8%)	5721 (32.9%)	11 620 (22.3%)	47 283 (25.5%)	<0.001
Psychotic disorder	16 496 (14.2%)	2574 (14.8%)	7791 (14.9%)	26 861 (14.5%)	<0.001
Mood disorder	13 908 (12.0%)	1598 (9.2%)	5636 (10.8%)	21 141 (11.4%)	<0.001
Intentional self-harm	9587 (8.3%)	1393 (8.0%)	3012 (5.8%)	13 992 (7.6%)	<0.001
Eating disorder	1989 (1.7%)	353 (2.0%)	1802 (3.5%)	4144 (2.2%)	<0.001
All other	43 968 (37.9%)	5741 (33.0%)	22 322 (42.8%)	72, 031 (38.8%)	–

Note: Data are described as number (% of presentations in time period) unless otherwise specified. Pre-pandemic: January 1, 2018–March 8, 2020; 114 weeks. Statewide Lockdown: March 9, 2020–June 28, 2020; 16 weeks. Restrictions easing: June 29, 2020–June 27, 2021; 52 weeks.
[a]Based on the Australasian triage scale.

three periods, with overall median of 32 years (IQR: 21–46). Compared with the Pre-Pandemic and Statewide Lockdown periods, a higher proportion of patients presenting in the Restrictions Easing period were pediatric (4.6% PP vs. 13.8% SL vs. 15.1% RE) and female (53.2% PP vs. 53.0% SL vs. 54.9% RE). A higher proportion of patients presenting during the Statewide Lockdown period were Aboriginal or Torres Strait Islander (13.1% PP vs. 15.4% SL vs. 13.6% RE) compared to the other periods. An increase in the proportion of ATS category 5 (lowest acuity) patients was observed during Statewide Lockdown, which fell markedly in Restrictions Easing, with a concomitant increase in ATS 2 and ATS 3 patients. Patients more frequently self-presented during Statewide Lockdown (43.1% PP vs. 44.9% SL vs. 40.8% RE) and more frequently presented by ambulance in the Restrictions Easing period (45.6% PP vs. 46.2% SL vs. 48.3% RE). Compared to other time periods, a higher proportion of presentations were for anxiety disorders in Statewide Lockdown (25.8% PP vs. 32.9% SL vs. 22.3% RE), and with eating disorders during Restrictions Easing (1.7% PP vs. 2.0% SL vs. 3.5% RE).

Patient waiting time to be seen was markedly shorter during Statewide Lockdown, with median 11 min compared to 17 min in the other time periods (Table 2). During Statewide Lockdown, there was an increased proportion of patients seen within the time recommended by ATS category (68.1% PP vs. 82.7% SL vs. 68.8% RE) and reduced ED length of stay (median 179 min PP vs. 142 min SL vs. 183 min RE). Furthermore, the proportion of patients discharged home from ED was higher in this time period (62.7% PP vs. 64.0% SL vs. 59.2% RE).

The time series model forecast 19 277 mental health presentations during the Statewide Lockdown period, whereas only 17 380 presentations were observed (Table 3). In the Restrictions Easing

TABLE 2 ED outcomes, by time period, for mental health presentations.

	Pre-pandemic	Statewide lockdown	Restrictions easing	Overall	*p*-value
Total	115 889	17 379	52 182	185 450	–
Time to be seen in minutes; median (IQR)	17 (7–44)	11 (4–24)	17 (7–39)	17 (7–39)	<0.001
Seen within recommended time frame by ATS score	78 883 (68.1%)	14 372 (82.7%)	35 899 (68.8%)	129 155 (69.6%)	<0.001
ED length of stay					
LOS in minutes—median (IQR)	179 (96–308)	142 (68–260)	183 (96–316)	177 (92–306)	<0.001
≤4 h	75 696 (65.3%)	12 610 (72.6%)	33 279 (63.8%)	121 584 (65.6%)	
>4 h	40 192 (34.7%)	4769 (27.4%)	18 902 (36.2%)	63 863 (34.4%)	
ED discharge disposition					<0.001
Discharged	72 624 (62.7%)	11 105 (64.0%)	30 829 (59.2%)	50 865 (61.9%)	
Admitted (mental health or medical ward)	32 070 (27.7%)	4324 (24.9%)	14 472 (27.8%)	50 866 (27.5%)	
Admitted (ED)	7735 (6.7%)	1428 (8.2%)	5245 (10.1%)	14 408 (7.8%)	
Transferred	3349 (2.9%)	490 (2.8%)	1499 (2.9%)	5338 (2.9%)	

Note: Data are described as number (% of presentations in time period) unless otherwise specified. Pre-pandemic: January 1, 2018–March 8, 2020; 114 weeks. Statewide Lockdown: March 9, 2020–June 28, 2020; 16 weeks. Restrictions easing: June 29, 2020–June 27, 2021; 52 weeks.
Abbreviations: ATS, Australasian triage scale; LOS, length of stay.

period, 71 003 mental health presentations were forecast compared to 51 843 observed. The observed weekly presentations were below the lower margin of the 95% PI in 11 out of 16 weeks in the Statewide Lockdown period and 52 out of 52 weeks in the Restrictions Easing period, representing a statistically significant reduction compared to forecast. The time series forecast and observed presentations are displayed in Figure 1. Similar patterns were seen for patients in the pediatric, adult, and older adult age groups and by male and female sex, with a reduction in presentations below forecast for all demographic characteristics and time periods, particularly in the Restrictions Easing period in which nearly all observed weekly presentations were below the lower bound of the 95% PI. Aboriginal and Torres Strait Islander patients showed a less marked decline in the Statewide Lockdown period, with 2656 mental health presentations observed versus 2787 predicted, but also showed presentations significantly below forecast in the Restrictions Easing period. Time series graphs by demographic category are shown in Figure S1.

Presentations with anxiety disorders also fell markedly below predictions in the Lockdown and Restrictions Easing periods, whereas presentations with mood disorders showed smaller reductions in both periods (Figure S2). Conversely, presentations with psychotic disorders and intentional self-harm increased slightly in the lockdown period, before falling to well below predicted. While presentations with eating disorders were comparatively rare, they increased markedly above forecast, with observed presentations above the 95% PI in 48 of 52 weeks in the Restrictions Easing period. Mental health presentations with ATS categories 1 and 2, representing the highest acuity presentations, remained at or above forecast, during both the Statewide Lockdown and Restrictions Easing periods (Figure S3). Categories 3, 4 and 5 presentations all demonstrated sustained decreases from forecast.

4 | DISCUSSION

After the COVID-19 pandemic declaration, Queensland's public hospital EDs saw significantly fewer mental health presentations than expected from Pre-Pandemic trends. This reduction in ED presentations persisted across all major demographic groups throughout the 16-month study period, with anxiety disorders and low acuity presentations showing the most significant decreases. In the context of the known deleterious effects of the COVID-19 pandemic on mental well-being and psychological distress (AIHW, 2022a; Chen et al., 2021; McGinty et al., 2020; Xiong et al., 2020), these findings have important implications for the efficient use of mental health resources to meet community needs.

Whereas pre-pandemic data showed rising mental health presentations, a reduction was observed beginning around the declaration of the COVID-19 pandemic on March 11, 2020. This is consistent with the findings of multiple other studies (Dragovic et al., 2020; Ferrando et al., 2021; Gómez-Ramiro et al., 2021; Goncalves-Pinho et al., 2021; Holland et al., 2021; Mukadam et al., 2021; Pikkel Igal et al., 2021; Stein et al., 2020). Weekly ED mental health presentation numbers remained below forecast levels despite the easing of COVID-19 pandemic restrictions. Similar findings were seen across the adult and older adult age groups, as well as for male and female sex, despite previous studies showing a positive association between younger age groups and female sex with psychological distress in the COVID-19 pandemic (Xiong et al., 2020). Pediatric mental health

TABLE 3 Forecast versus observed emergency department mental health presentations (March 9, 2020 to June 27, 2021).

	Statewide lockdown ($n = 16$ weeks)					Restrictions easing ($n = 52$ weeks)				
	Total forecast presentations	Observed presentations (% of forecast)	Weeks below 95% PI	Weeks within 95% PI	Weeks above 95% PI	Total forecast presentations	Observed presentations (% of forecast)	Weeks below 95% PI	Weeks within 95% PI	Weeks above 95% PI
Overall	19 277	17 380 (90.2)	11	5	0	71 004	51 843 (73.0)	52	0	0
Age category										
Pediatric (5–17)	2701	2396 (88.7)	9	7	0	9652	7852 (81.4)	46	6	0
Adult (18–64)	14 414	13 586 (94.3)	7	9	0	52 059	40 254 (77.3)	52	0	0
Older adult (≥65)	1992	1398 (70.2)	13	3	0	8398	3737 (44.5)	52	0	0
Sex										
Male	9096	8165 (89.8)	10	6	0	33 930	23 336 (68.8)	52	0	0
Female	10 065	9208 (91.5)	12	4	0	36 492	28 447 (78.0)	52	0	0
Indigenous status	2787	2656 (95.3)	7	4	5	10 838	6997 (64.6)	52	0	0
Aboriginal or Torres Strait Islander										
Diagnostic category										
Anxiety disorder	7454	5721 (76.8)	12	2	2	31 746	11 549 (36.4)	52	0	0
Psychotic disorder	2432	2574 (94.5)	1	9	6	8809	7752 (88.0)	33	19	0
Mood disorder	1807	1598 (88.4)	7	8	1	5855	5597 (95.6)	12	38	2
Intentional self-harm	1230	1393 (113.3)	0	9	7	4267	2994 (70.2)	45	4	3
Eating disorder	253	353 (139.5)	1	7	8	922	1792 (194.4)	0	4	48
Triage category										
1	106	118 (111.3)	0	14	2	413	381 (92.3)	11	33	8
2	2280	2347 (102.9)	0	13	3	7409	8001 (108.0)	0	33	19
3	9331	8635 (92.5)	8	8	0	32 654	29 406 (90.1)	44	8	0
4	5225	4462 (85.4)	12	4	0	19 952	12 029 (60.3)	52	0	0
5	2291	1818 (79.4)	7	5	4	10 408	2026 (19.5)	52	0	0

Abbreviation: PI, prediction interval.

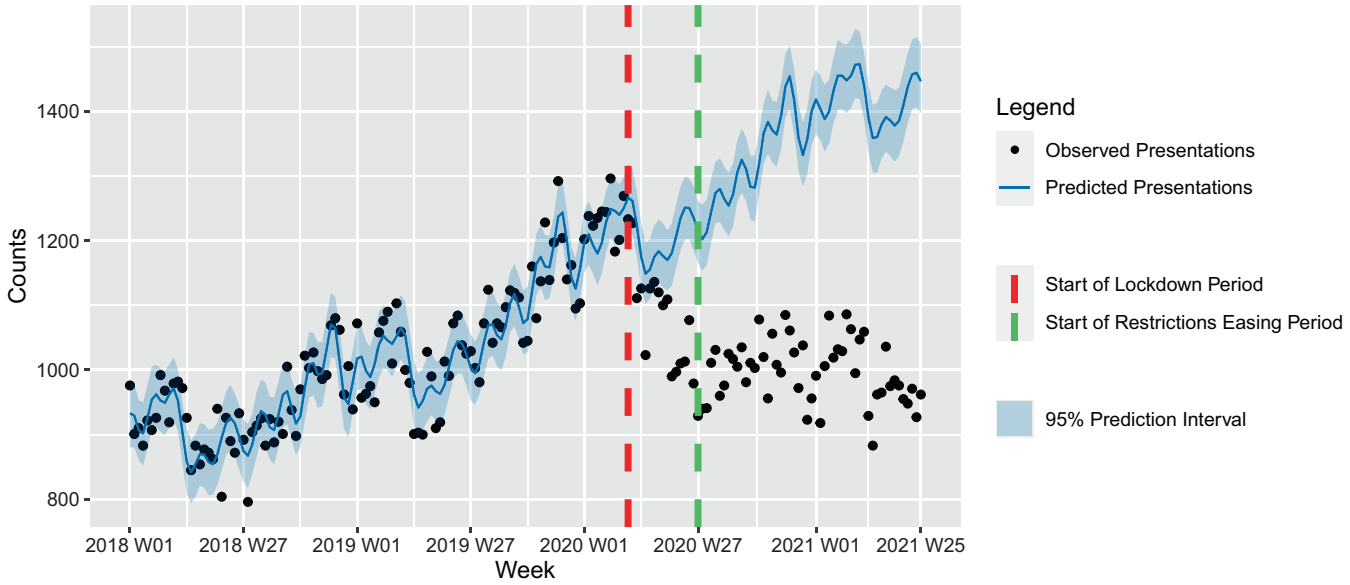

FIGURE 1 Overall weekly emergency department mental health presentations with time series forecast of pre-pandemic trend.

presentations in our study also remained below the forecast 95% PI in most weeks following the pandemic declaration; these findings are in contrast to previous data for pediatric mental health presentations, which showed an earlier return to baseline (Leeb et al., 2020). This difference may relate to the limited duration of school closures in Queensland, thus minimizing the disruption to social connections, academic and emotional development that are important determinants of mental health in children and adolescents (Golberstein et al., 2020).

Trends in ED presentations differed by category of mental health disorder. Anxiety disorders, the most common diagnostic category, showed the most marked and sustained decrease, whereas mood disorders showed a relatively small reduction. As the overall societal burden of both anxiety and major depressive disorders increased during the COVID-19 pandemic (Santomauro et al., 2021), this discrepancy may reflect patients with anxiety disorders being particularly reluctant to attend hospital during a pandemic, or be coded with a somatic complaint upon hospital presentation. Presentations with psychotic disorders increased during the Statewide Lockdown period, similar to previous research (Jagadheesan et al., 2021), but decreased during the Restrictions Easing period. A previous study of patients with early psychosis found evidence of both reduced ED presentations and worsening symptoms during the pandemic, raising concern for untreated disease (Szmulewicz et al., 2021). Self-harm presentations also decreased during the Restrictions Easing period, although this analysis is limited by relatively low case numbers and variable coding practices for these patients (Sveticic et al., 2020). Notably, while data suggest that the number of suicide deaths in Queensland has remained unchanged after the pandemic declaration (AIHW, 2022b), the pandemic was linked to 8.3% of suspected suicides from March 1, 2020 to December 31, 2020 (Leske et al., 2021). Presentations with eating disorders increased markedly during the pandemic. This increase has been identified in multiple previous studies (Irigoyen-Otinano et al., 2021; Lin et al., 2021; Toulany et al., 2021) and may relate to decreased access to treatment, loss of routine and structure, social messaging, and malign media influences (Devoe et al., 2022). Mental health presentations with the most urgent triage category (ATS 1 or 2) met or exceeded forecasts, whereas ATS 3–5 presentations reduced significantly. This finding suggests that while less emergent presentations may have delayed, avoided, or been diverted to an alternate mode of mental health care delivery, the highest acuity patients appropriately presented to the ED.

The observed reduction below forecast in ED presentations for mental health conditions during the COVID-19 pandemic, despite multiple previous studies showing overall higher rates of psychological distress at this time period (AIHW, 2022a; Chen et al., 2021; McGinty et al., 2020; Xiong et al., 2020), may partly reflect the implementation and expansion of alternate modes of mental health service activity. The Statewide Lockdown period corresponded to a steep increase in telehealth delivery of mental-health services in Queensland (AIHW, 2022a), from a negligible baseline to nearly 50% of services delivered, aided by the temporary addition of a number of telehealth items to the Medicare Benefits Scheme (MBS). Queensland's telehealth usage gradually declined during the Restrictions Easing period and as of January 2022 was well below Victoria and New South Wales (AIHW, 2022a). A previous survey of telemedicine for mental health-care delivery suggested this modality was primarily used for patients already established in care (Mansour et al., 2021) and thus may be less appropriate or accessible for patients with new or untreated mental health conditions.

The expansion of the *Better Access Pandemic Support* program added 10 MBS-subsidized psychological therapy sessions yearly for eligible patients (Australian Government Department of Health, 2020). Crisis and support organizations such as Lifeline and Beyond Blue have also seen an increase in both funding and demand

(AIHW, 2022b) and may help to mitigate the mental health consequences of social isolation. Economic programs such as the JobKeeper and increased JobSeeker payments may have reduced the adverse mental health consequences of financial stress caused by the pandemic's economic effects (Bowman et al., 2021). These findings underscore the critical role of telehealth and other alternative care models in sustaining community mental health support during the pandemic and should be leveraged by clinicians and policymakers in future crises to adapt to changing presentation patterns.

The reduction in ED presentations below the forecast may also reflect inadequately treated mental illness. Previous studies have associated the COVID-19 pandemic with a reduction in ED presentations for emergent conditions such as myocardial infarction (Mesnier et al., 2020) and stroke (Mitra et al., 2020), as well as increased cancer deaths due to delayed diagnosis (Maringe et al., 2020). Reasons for ED avoidance include fear of contracting COVID-19 (Pikkel Igal et al., 2021), system overload concerns and uncertainty regarding lockdowns (Jessup et al., 2021). Furthermore, individuals experiencing social disadvantage may depend more on ED for mental health care (Anderson et al., 2022) and be less able to access alternate modalities such as telemedicine (Zhai, 2021). Of note, Aboriginal and Torres Strait Islander people represent 4.0% of the Queensland population (ABS, 2019) but 13.4% of mental health-related ED presentations in this dataset, and thus may be disproportionately affected by ED avoidance. Furthermore, previous Australian research has shown that telehealth services are less likely to be used by people requiring an interpreter (Gallegos-Rejas, Kelly, Lucas, et al., 2023), despite these individuals reporting similar or higher levels of trust in these services (Gallegos-Rejas, Kelly, Snoswell, et al., 2023). Identified barriers to accessing telehealth include language barriers, low health literacy and lack of access to technology or facility in its use. Further research should evaluate the role that ED avoidance played in reduced mental health presentations during the pandemic, as well as addressing limitations in access to telehealth and other alternative care modalities.

5 | LIMITATIONS

This study used diagnostic codes from a large electronic health record (EHR) system to identify mental health related ED presentations and specific diagnoses. The study findings are thus limited by the accuracy of this data, with previous work showing that mental health related diagnoses including suicide and intentional self-harm are underenumerated by diagnostic coding (Sveticic et al., 2020). While this limitation of EHR data likely influences observed presentation numbers, it is not expected to differ systematically between study periods and is thus unlikely to significantly bias the study findings. The time series analysis model is limited by a relatively short Pre-Pandemic timeperiod of 114 weeks. While this is longer than most other reports comparing ED presentations before and during the COVID-19 pandemic, a longer pre-pandemic data set would allow for more robust estimates of trend and seasonality. Similarly, the study period extends to 68 weeks post-pandemic declaration; follow-up studies will be needed to ascertain the long-term effects of the pandemic on mental health presentations to the ED. A limitation of all observational studies is the difficulty of inferring causality. While a clear temporal association exists between the reduction in mental health presentations and the COVID-19 pandemic, it is not possible to establish whether this reduction was induced by the pandemic directly, by the associated public health response, or by other related or concurrent events. Finally, the observed findings are influenced by contingent factors of the COVID-19 pandemic in Queensland, which included low case numbers and strict but brief lockdowns during this phase, which may limit generalisability to settings with very different pandemic experiences.

6 | CONCLUSION

In this retrospective cohort study, overall weekly mental health presentations to EDs across Queensland were significantly lower than predicted for at least 16 months following the declaration of the COVID-19 pandemic. Subgroup analysis showed the most marked reduction in presentations for anxiety disorders, with a lesser reduction for psychotic disorders and mood disorders, whereas presentations for eating disorders became more frequent. This reduction in case presentations was not seen for patients with the most urgent triage categories, suggesting that much of the observed reduction was for lower acuity patients. Clinicians should be aware of the limitations of emergency department care in addressing mental illness and healthcare inequities during a pandemic. Developing telehealth and other alternative care models is essential to further improve resilience against future public health crises.

AUTHOR CONTRIBUTIONS

PJ made substantial contribution to the design of the work, analysis and interpretation of data for the work and led the drafting of the manuscript. JC contributed to the conception of the work, acquisition of data, and interpretation of data. AS contributed to the conception of the work, acquisition of data, data analysis, and interpretation of data. GB contributed to the interpretation of data for the work. GK, AM, YLH, JR, DP contributed to the conception of the work, and interpretation of data. All authors (PJ, JC, AS, GB, GK, AM, YT, YLH, EH, JR, DP) revised the work critically for important intellectual content, provided final approval for the version to be published and agree to be accountable for all aspects of the work.

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CONFLICT OF INTEREST STATEMENT

Some authors were employees at the institutions where the present study was undertaken. The views and findings presented in the present paper are those of the investigators and do not represent those of collaborating organizations.

DATA AVAILABILITY STATEMENT

We are unable to share or make publicly available data used for the present study due to ethical and data privacy requirements.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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