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RESEARCH PAPER

FACTORS IN PSYCHIATRIC ADMISSIONS: BEFORE AND DURING THE COVID-19 PANDEMIC

Robyn H McCarron, Peter Swann, Jonathon Artingstall, Anne-Marie Burn, Julia Deakin, Fiona Ellis, Praveen Kumar Gandamaneni, Joannah Griffith, Amanda Ireland, Jim Leadbetter, Joyce Man, Simon Mitchell, Asha Praseedom, Ilyana Rokkou, Clare Rose, Ginny Russell, Patricia Worsnip, Graham K Murray, Fiona Thompson

Abstract

Objective: The COVID-19 pandemic has impacted community mental health, but the effect on psychiatric admissions is unknown. We investigated factors contributing to acute psychiatric admissions, and whether this changed during the first UK lockdown.

Method: A retrospective case-note review study with an exploratory mixed-methods design to examine factors for psychiatric admissions following the first UK 2020 lockdown compared to the same time periods in 2019 and 2018.

Results:Themes of psychopathology, risk, social stressors, community treatment issues, and physical health concerns were generated. The mean number of codes per case was 6.19 (s . d. = 2.43), with a mean number of categories per case of 3.73, (s. d. = 0.98). Changes in routines and isolation were common factors in the study year; accommodation and substance abuse were more prominent in the control year. Relationship stressors featured strongly in both groups. There were significantly more women ($\chi2(1, N = 98) = 20.80$, $p < 0.00001$) and older adults ($\chi2(1, N = 98) = 8.61$, $p = 0.0033$) in the study group than the control. Single people, compared to those in a relationship ($\chi2(1, N = 45) = 4.46$, $p = 0.035$), and people with affective disorders compared to psychotic disorders (($\chi2(1, N = 28) = 5.19$, $p = 0.023$), were more likely to have a COVID-19 related admission factor.

Conclusions:Early stages of the COVID-19 pandemic amplified pre-existing psychosocial vulnerabilities with a disproportionate psychiatric admissions impact on the mental health of women, older adults and those with affective disorders.

Key words: COVID-19, psychiatry, mental health, inpatient, qualitative

Robyn H McCarron[1], Peter Swann[1,2], Jonathon Artingstall[1], Anne-Marie Burn[2], Julia Deakin[1], Fiona Ellis[3], Praveen Kumar Gandamaneni[1], Joannah Griffith[1], Amanda Ireland[1], Jim Leadbetter[1], Joyce Man[2], Simon Mitchell[1], Asha Praseedom[1], Ilyana Rokkou[1], Clare Rose[1], Ginny Russell[1], Patricia Worsnip[1], Graham K Murray[1,2], Fiona Thompson[1]

[1.] Cambridgeshire and Peterborough NHS Foundation Trust, Cambridge, UK
[2.] University of Cambridge, Department of Psychiatry, Cambridge, UK
[3.] Research Design Service East of England, National Institute of Health Research (NIHR) Research Design Service (RDS), UK

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* Graham K Murray and Fiona Thompson made equal contributions

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Corresponding author

Dr Robyn McCarron,
E-mail: robyn.mccarron@cpft.nhs.uk

Introduction

The UK National Health Service (NHS) declared a major incident in response to the novel coronavirus COVID-19 pandemic on the 3rd of March 2020. On the 23rd of March, the UK began a societal lockdown in response to rising infection rates. This consisted of a government mandated stay at home order with closure of all non-essential shops and businesses. Schools and child-care providers closed to all except the children of "key-workers" and those considered vulnerable.

Concerns were raised about the impact of lockdown on mental health (Webb, 2020), supported by surveys of community samples demonstrating rising mental health symptoms (Iob, Frank, Steptoe, & Fancourt, 2020; Kwong *et al*., 2020). Potential precipitants of worsening mental health include social isolation (Leigh-Hunt *et al*., 2017), magnification of social and environmental stressors of household members living together (Evans, Wells & Moch, 2003), rising unemployment (Office for National Statistics (ONS), 2020) economic hardship, and loss of role. These stressors are anticipated to increase the incidence of new-onset mental illness, and lead to relapse and recurrence in those with a history of mental disorder (Sheridan Rains *et al*., 2020). It is therefore essential to examine the impact of the pandemic not just on community wellbeing but also on severe mental illness requiring acute inpatient psychiatric treatment.

This study focussed on the early stages of the COVID-19 pandemic in the UK and aimed to:

1. Identify common factors that contribute to a person requiring acute psychiatric admission.

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2. Elicit any direct or indirect consequences of COVID-19 contributing to acute psychiatric admission.
3. Explore if COVID-19 has led to a quantitative shift in the broad biopsychosocial factors contributing to psychiatric admission.

Methods

Study design

A retrospective case-note review study with an exploratory mixed-methods design (Creswell & Clark, 2017) was used to examine factors in acute adult and older-adult psychiatric admissions over a three-year period. Admissions following the UK 2020 lockdown were then compared to the same time periods in 2019 and 2018 to identify the impact of COVID-19.

This study was approved as a service evaluation by the NHS Trust, and thus no research ethical approval or informed consent was required. General Data Protection Regulation was followed. The high frequency of personally identifiable data prohibited anonymization of the data set, so access was restricted to the Trust clinicians undertaking analysis.

Experts by experience

A group of six experts by experience (EbE) was recruited from the Trust service user and carer research group. It included five women and one male, four adults and two older adults. The group had lived experience of a range of mental disorders and psychiatric admissions.

The group met via videoconference three times with a facilitator and RM. The group provided written feedback on the protocol, results and reporting. Two EbEs sat on the study steering group. The input of the EbE group resulted in significant changes to the study design, shaped the coding framework and interpret the results.

Study setting

The study was conducted within the two mental health hospitals of an NHS Foundation Trust, Cambridgeshire and Peterborough NHS Foundation Trust (CPFT). CPFT supports a population of around one million people (Cambridgeshire and Peterborough Clinical Commissioning Group, 2020), covers diverse rural and metropolitan areas, and is the sole provider of acute psychiatric inpatient services in the catchment area.

Sample

Cases were identified using system-generated reports from the Rio Electronic Patient Record (EPR) system (Servelec Healthcare Ltd, 2014). The study sample was formed from 50 consecutive admissions to the acute adult and older-adult wards of CPFT between the 23rd of March 2020, the start of the government mandated lockdown, to the 29th of June 2020, capturing the entire duration of the UKs first period of national lockdown. The control sample was obtained from consecutive admission to the wards from the same date onwards, one and two years previously (25 admissions from 23rd March 2019 on and 25 admission from 23rd March 2018 on). One case from the study year and one from the control year were excluded from the study as they had no admission assessment, resulting in sample of 49 in the study group and 49 in the control group. For the investigation of general factors contributing to admission, the groups were combined together as one. Theoretical saturation (Glaser & Strauss 1967) was achieved.

Data source and extraction

Data was extracted from the electronic patient record into Microsoft Excel. Demographic information was recorded.

The richest source of qualitative data was determined by independently analyzing the admission assessments (RiO "core assessment") and the first five days of multi-disciplinary inpatient progress notes for the first 25 study cases. Analyzing inpatient progress notes did not identify additional factors ($t(48) = -1.33$, $p = 0.19763$) so admission assessments alone were used.

We supplemented our local data with an examination of national admissions data. Admissions numbers for England for April and May 2020 and from April and May 2019, for adult mental illness (65 years and under), and for old age psychiatry (over age 65), were extracted from publicly available data produced by the national data organization NHS Digital (2020). National data stratified by other factors were not publicly available.

Qualitative data analysis

Qualitative analysis was conducted using a framework approach (Ritchie & Spencer, 1994), following the process described in Gale, Heath, Cameron, Rashid, & Redwood (2013). RM and PS independently coded five sets of notes from the study period using an inductive approach. This generated a list of categories and codes of factors contributing to psychiatric admission. The EbEs deduced an independent list of categories and codes based on their experiences and understanding. These lists were merged into a single coding framework agreed by the EbEs. A duplicate coding framework was created to capture factors in admission directly or indirectly due to COVID-19. The coding framework was further refined in response to identified themes. Qualitative data analysis was managed using Nvivo 12 (QSR international, 1999). Memos were used to record reflections. Multiple codes both within and between categories could be applied to each case. When data from the study years was coded to the COVID-19 framework it was also coded to the main framework.

RM and PS independently coded the 49 admission assessments from the study year and the interrater reliability was assessed before disagreements were resolved. Given substantial agreement between coders (Cohen's $k = 0.67$) the remaining assessments were coded by just RM.

Quantitative data analysis

Quantitative analysis was performed using Microsoft Excel by RM and PS. Descriptive statistical analysis was performed on the frequencies of cases per code and codes per case. Sample demographic statistics we analyzed. The chi-square test was used to determine differences in the relative numbers of different categories of factors contributing to admission in the study and control years.

Differences based on demographic factors were explored. Binary groupings of demographic factors

were used to facilitate meaningful analysis for age group (adult or older adult), sex (female or male), relationship status (single or in a relationship), ethnicity (white or black and ethnic minorities), and primary diagnosis (affective or psychotic disorder). Nvivo 12 was used to undertake cluster analysis using Jaccard's coefficient.

Reflexivity

The research team worked within the study NHS Trust. Whilst the study steering group was multi-disciplinary, the data analysis was undertaken by psychiatrists introducing a potential medical bias. This study was conducted largely by font-line staff working during the COVID-19 pandemic, who will have been biased by their own experiences. The impact of these biases was reduced through memoing and the input of the EbEs.

Results

Sample

The sample demographics are shown in **table 1**.

Table 1. *Sample demographics*

Demographic		Study group		Control group	
		n	%	n	%
Age group	<65 years	35	71	46	94
	>65 years	14	29	3	6
Sex	M	19	38	41	84
	F	30	60	8	16
Ethnicity	White	44	88	38	78
	Black or Black British	3	6	2	4
	Asian or Asian British	1	2	3	6
	Mixed	1	2	2	2
	Other	0	0	4	8
Employment	Employed	3	6	1	2
	Retired	10	20	4	8
	Unemployed	37	76	43	88
	Unknown	2	4	1	2
Relationship	In a relationship	12	24	9	18
	Single	33	67	40	82
	Unknown	4	8	0	0
Diagnosis	Affective disorder	18	37	6	12
	Psychotic disorder	10	20	23	47
	Personality disorder	5	10	2	4
	Other	5	10	3	6
	Unknown	11	22	15	31

Table 2. *Table showing the number of cases per code*

Code	Study group		Control group	
	n	%	n	%
Community treatment issues	35	71	33	67
Access to mental health support	17	35	16	33
Disruption to medication regimes	30	61	30	61
Physical Health concerns	20	41	15	31
Psychopathology	45	92	49	100
Affective symptoms	37	76	29	59
Psychotic symptoms	33	67	40	82
Risk	48	98	42	86
To self	47	96	29	59
To others	26	53	30	61
From others	10	20	9	18
Social stressors	44	90	36	73
Accommodation	19	39	25	51
Changes in routine	31	63	4	8
Substance abuse	10	20	25	51
Income and employment	16	33	16	33
Isolation	20	41	5	10
Relationships	23	47	19	39
Care package	10	20	8	16

Factors contributing to acute psychiatric admission

Five themes were generated, falling into categories of community treatment issues, physical health concerns, psychopathology, risk, and social stressors (**figure 1**). Psychopathology was the most frequently identified code (study group = 92%, control group = 100%), followed by risk (study group = 98%, control group = 86%), and social stressors (study group = 90%, control group = 73%) (**table 2**). The mean number of codes per case was 6.19 (s. d. = 2.43). The mean number of different categories per case was 3.73 (s. d. = 0.98).

Community treatment issues were understood in terms of access to mental health support and disruption to medication regimes. Access to mental health support encompassed issues around both the availability of NHS and third sector support, in addition to challenges in a person engaging with such services. Disruption to medication regimes included nonadherence to prescribed medication by patients, changes or discontinuation of medication by prescribers, and any issues in the dispensing, administration and monitoring of medications for mental health.

Physical health concerns contributed to admissions as both a consequence and cause of deteriorating mental health. This theme was often linked to concerns around

Figure 1. *Coding framework of factors contributing to acute psychiatric admissions*

risk of self-neglect, disruption of medication regimes with nonadherence to physical health medications, and social themes; particularly related to changes in social care support required following physical illness. More directly, some admissions were linked to the neuropsychiatric consequences or psychological experiences of physical illness, or medically unexplained symptoms.

Psychopathology and risk featured prominently. In many cases people were admitted with a combination of affective and psychotic features. Risk to self included self-harm, suicide, and self-neglect. Risk to others was typically characterized by aggressive behavior. Concerns around risk from others was commonly a reflection of a person's vulnerability. However, there were examples of more direct risks such as financial and physical abuse, radicalization and grooming.

In most cases social stressors, such as relationship stressors, accommodation issues, and loss of income and employment, had directly contributed to a deterioration in mental state. However, a significant minority of people, especially in the older adult age group, were admitted acutely for largely social reasons, such as an inadequate care package. Substance abuse had a dual role in admission by both contributing to psychopathology and prohibiting safe and effective community treatment.

Demographic differences

There was no significant difference in the distribution of codes across categories based on sex ($\chi2(4, N = 367) = 1.74$, $p = 0.78$), age group ($\chi2(4, N = 367) = 1.38$, $p = 0.85$) relationship status ($\chi2(4, N = 350) = 4.22$, $p = 0.38$), ethnicity ($\chi2(4, N = 367) = 2.25$, $p = 0.69$), or primary diagnosis ($\chi2(4, N = 201) = 0.46$, $p = 0.98$).

Relationships between admission factors

A cluster analysis was performed combining both the study and control groups. Three main branching clusters were generated (**figure 2**). Risk from others, care package, and changes in routines formed cluster A. Physical health concerns, psychotic symptoms, risk to self, affective symptoms, and disruption to medication regimes formed cluster B. The final cluster, C, consisted of substance abuse, access to mental health support, accommodation, income and employment, isolation, relationships, and risk to others.

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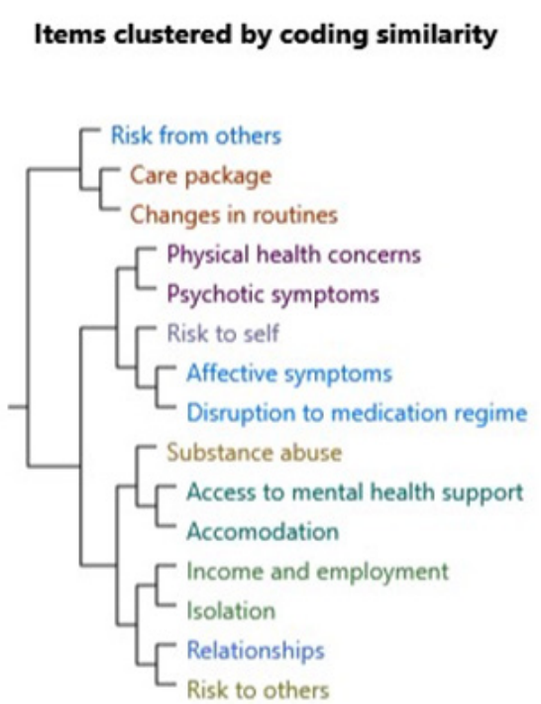
Figure 2. *Clustering of codes by coding similarity*



The impact of COVID-19

There was no significant difference in the group ages ($t(96) = 0.47$, $p = 0.64$) with a mean age of 51.84 (s. d. = 17.53) years in the study group and 50.34 (s. d. = 13.69) years in the control group (**table 1**.). There were no significant differences between the study and control group for ethnicity ($\chi2(4, N = 98) = 3.76$, $p = 0.44$), employment ($\chi2(3, N = 98) = 4.27$, $p = 0.23$), or relationship status ($\chi2(2, N = 98) = 2.89$, $p = 0.24$). However, there were significantly more women ($\chi2(1, N = 98) = 20.80$, $p < 0.00001$) and older adults over 65 ($\chi2(1, N = 98) = 8.61$, $p = 0.0033$) in the study group than the control. There was a significant difference in the distribution of primary diagnoses ($\chi2(4, N = 98) = 13.52$, $p = 0.0090$), with the study group having more affective and the control year more psychotic disorders.

National data indicated that the percentage of admissions for older adults was greater in 2020 compared to 2019 (percentage of older adult admissions of combined older and working age adults: 19.3% in April 2020 compared to 16.5% in April 2019, and 15.4% in May 2020 compared to 14.9 % in May 2019). This was due to a substantially reduced number of adult psychiatric admissions in April -May 2020 in working age adults (9853 in 2020 down from 12750 in 2019) and a slightly reduced number of old age psychiatry admissions in 2020 (2075 in 2020 and 2382 in 2019).

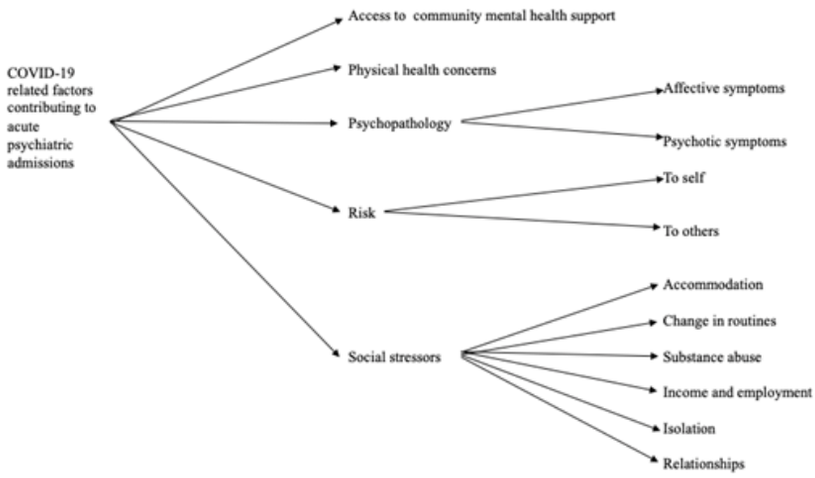
Consequences of COVID-19 contributing to admission

There were no factors associated with COVID-19 that could not be understood within the broader framework. There were no cases where COVID-19 was considered to have impacted on disruption to medication regimes, risk from others, or a person's care package (**figure 3**). In the study year consequences of COVID-19 was a feature in 53% (n = 26) of patients. In that group (n = 26) the mean number of COVID-19 related factors was 1.73 (s. d. = 1.05) across a mean number of categories of 1.4 (s. d. = 0.50) (**table 3**).

Table 3. *Table showing the number of COVID-related factors in the study year*

Code	Study group	
	n	%
Access to community mental health support due to COVID-19	7	14
Physical Health concerns related to COVID-19	4	8
Psychopathology related to COVID-19	8	16
Affective symptoms	3	6
Psychotic symptoms	5	10
Risk related to COVID-19	3	6
To self	2	4
To others	1	2
Social stressors related to COVID-19	15	31
Accommodation	3	6
Changes in routine	5	10
Substance abuse	1	2
Income and employment	2	4
Isolation	9	18
Relationships	5	10

Figure 3. *Coding framework of COVID-19 related factors contributing to acute psychiatric admissions*



Within the study group there was no difference in the proportions of individuals with COVID-19 related factors based on sex ($\chi2(1, N = 49) = 0.29, p = 0.59$), age group ($\chi2(1, N = 49) = 0.99, p = 0.32$), or ethnicity ($\chi2(1, N = 49) = 0.51, p = 0.47$). However, single people were significantly more likely to have a COVID-19 related factor than those in a relationship ($\chi2(1, N = 45) = 4.46, p = 0.035$). People with affective disorders as a primary diagnosis were also more likely to have a COVID-19 related factor than those with psychotic disorders ($\chi2(1, N = 28) = 5.19, p = 0.023$).

Is the COVID-19 pandemic associated with any changes in the reasons for acute psychiatric admissions?

There was no significant difference between the study and control groups in the number of codes per case ($t(96) = 1.21, p = 0.23$) or the number of categories per case ($t(96) = 1.66$, p = 0.10). There was no significant difference in the distribution of codes across categories between the study and control years ($\chi2(4, N = 367) = 1.36, p = 0.85$).

When the distribution of codes within categories between years was considered there was no significant difference in the factors within community treatment ($\chi2(1, N = 93) = 0.02$, p = 0.89), psychopathology ($\chi2(2, N = 139) = 1.63$, p = 0.20) ($\chi2(2, N = 151) = 3.14$, p = 0.21). However, there was a significant difference in the distribution of codes within social stressors between years ($\chi2(4, N = 181) = 34.66$, p < 0.0001). Changes in routines and isolation were common factors in the study year, whilst accommodation and substance abuse were more significant in the control year. Relationship stressors featured prominently in both groups.

Discussion

This study identified common factors that contributed to a person requiring acute psychiatric admission during the first UK 2020 lockdown due to the COVID-19 pandemic. The number and diversity of reasons contributing to psychiatric admission reflects the increasingly high threshold of risk and need required for acute psychiatric admission (The Strategy Unit, 2019). Although the COVID-19 pandemic introduced additional infection control risks into admission decisions, this did not have a significant impact on the number of biopsychosocial factors in admission. The frequency of risk, psychopathology, and social stressors reflect a trend towards criteria for admission mirroring criteria for detention under the mental health act (Department of Health, 2015). There has been significant political attention to the risks of acute hospitals reaching capacity during this pandemic, but little consideration to the fact that demand outstripping capacity is an ongoing reality in psychiatric hospitals (The Strategy Unit, 2019).

The clustering of admission reasons is suggestive of three broad patient groups. Crudely, these groups were suggestive of patients with social admissions (A), "severe mental illness" including psychotic and affective disorders (B), and personality disorders and substance misuse (C). Caution is needed in interpretation due to sample size and study design, but this warrants further investigation in a larger study. Evidence around the benefit of admission varies across the groups (Tsoutsoulis, Maxwell, Menon Tarur Padinjareveettil, Zivkovic& Rogers, 2020), so understanding and addressing the factors contributing to admission may facilitate diversion into more evidenced based care pathways (Gandré, Gervaix, Thillard, Macé, Roelandt & Chevreul, 2018; Grenyer, Lewis, Fanaian & Kotze, 2018).

The COVID-19 pandemic is having a diverse and severe impact on mental health, being a factor in admission in over half our sample. This demonstrates that the effects of COVID-19 are seen at an inpatient level and not only in community samples (Iob et al., 2020; Kwong et al., 2020). The lack of difference in the broad categories of admission across the control and study years reflects the all-encompassing impact that the pandemic has had. However, within social stressors, changes in routines and isolation become more predominant factors after lockdown, with single people more commonly reporting an impact of COVID-19. Although detecting shifts in the relative weightings of stressors leading to admission is beyond the scope of this study, it appears COVID-19 has increased pressure on pre-existing areas of vulnerability. This is concerning because it will further widen existing health and social inequalities (Ahmed, Ahmed, Pissarides, & Stiglitz, 2020).

Indeed, our findings show a disproportionate impact of COVID-19 on certain groups during this phase of the pandemic. In keeping with community studies (Iob et al., 2020; Kwong et al., 2020), our study found COVID-19 to be associated with a greater impact on the mental health of women and people with affective disorders. There is growing concern about the impact of

COVID-19 on the wellbeing of women internationally due to the magnification of pre-existing economic, social, and healthcare inequalities, domestic abuse, and patriarchal policy responses (Fuhrman & Rhodes, 2020). With changes to mental health service provision (Holmes et al., 2020), decreased social contacts, and depressive symptomatology it is possible that the increase in admissions for people with affective disorder is in part due to a delay in appropriate community treatment as well as a possible increase in prevalence. A reduction in demand (help-seeking) for local mental health services has been shown (as well as reduction in supply) and it may be this reduction was inappropriate or pent-up demand and resulted in increased the admissions for affective disorders (Chen *et al.,* 2020). The reduction in accommodation as an admission factor may represent a highly modifiable risk factor for psychiatric admission; on 26 March 2020, the Minister for Local Government and Homelessness wrote to local authorities asking them to urgently accommodate all rough sleepers and focus on the provision of adequate facilities to enable people to adhere to the guidance on hygiene or isolation, including for those who are at risk of sleeping rough. It is possible that the UK government action (2020) had a direct effect in reducing this factor in psychiatric admissions.

A notable finding was an increase in older-adult admissions. For this group, isolation, government policy, psychological appraisal, and the media's portrayal of the pandemic has created a "perfect storm" for mental health (Webb, 2020).

Limitations

This study was conducted as a service evaluation within a single NHS Trust (which supports a population of about one million people) in a single country and only focussed on the early stage of the pandemic. The pattern of a relatively higher percentage of older adult admissions in 2020 compared to 2019 was seen in our Trust admissions and also seen in national admissions data, but national admissions data was not available stratified by other factors of interest. The amount of study data varied between cases and its richness and emphasis was influenced by the biases and constraints of the admitting clinician, as well as the patient's ability to engage, and the availability of collateral information. The impact of this was reduced by the sample size and the collection of data across time points, clinical teams, and locations. The impact of researcher bias on the results was limited through reflexivity and validation by the EbEs.

Conclusions

The COVID-19 pandemic has had a significant impact on acute psychiatric admissions. Our findings suggest that in its effect on psychiatric admissions it has amplified pre-existing psychosocial vulnerabilities with a disproportionate impact on the mental health of women, the elderly and those with affective disorders. In the face of future crises, we would urge policy makers to consider equal protection of mental and physical health. Facilitating ongoing, if need be adapted, mental health service provision, social support, connectedness and resilience seems key in this (Simblett *et al.,* 2021). As this pandemic evolves so will its mental health impact. Although much of the initial focus of the NHS has been on coping with increased admissions to acute hospitals and expanding the ability of the NHS to provide respiratory support and critical care beds (Stevens & Pritchard, 2020), it is important that we do not let this eclipse the need to embed a sustainable response to mental health challenges. It is therefore vital that COVID-19 becomes a catalyst for social change, research, and service improvement; rather than an excuse for stalling, or not-initiating action in these areas (Holmes et al., 2020).

Data sharing

De-identified data will be made available from the CPFT Improvement and Effectiveness department on reasonable request and may be subject to a data sharing agreement.

CPFTImprovement&Effectiveness@cpft.nhs.uk

Contributions

Conceptualization: Robyn McCarron, Fiona Thompson.

Methodology: Jonathan Artingstall, Anne-Marie Burn, Fiona Ellis, Joannah Griffith, Amanda Ireland, Joyce Man, Robyn McCarron, Graham Murray, Ilyana Rokkou, Clare Rose, Ginny Russell, Fiona Thompson, Patricia Worsnip.

Formal analysis: Robyn McCarron, Peter Swann.

Investigation: Robyn McCarron, Peter Swann, Ilyana Rokkou, Fiona Thompson.

Validation: Ilyana Rokkou, Joannah Griffith, Amanda Ireland, Care Rose, Ginny Russell, Patricia Worsnip.

Data Curation: Robyn McCarron, Fiona Thompson

Writing - Original Draft: Robyn McCarron, Graham Murray.

Writing - Review & Editing: Anne-Marie Burn, Julia Deakin, Joyce Man, Robyn McCarron, Graham Murray, Peter Swann, Fiona Thompson.

Supervision: Jim Leadbetter, Graham Murray, Ilyana Rokkou, Fiona Thompson.

Project administration: Praveen Kumar Gandamaneni, Amanda Ireland, Jim Leadbetter, Robyn McCarron, Simon Mitchell, Asha Praseedom, Ilyana Rokkou, Ginny Russell, Fiona Thompson.

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