The impact of the COVID-19 pandemic and earthquake on mental health of persons with severe mental illness: A survey study among people receiving community mental health care versus treatment as usual in Croatia

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Abstract

Background: The COVID-19 pandemic led to the disruption of mental health services in most countries. Croatia has been developing and strengthening its mental health system, including the introduction of community mental health teams (CMHT) for persons with severe mental illness (SMI), whose implementation was ongoing during the pandemic through the RECOVER-E project.

Aims: The aim of this study was to assess the differences in mental health outcomes, perceived social support and healthcare utilization in the group of participants receiving treatment as usual (TAU group) compared to the group receiving TAU and additional care by the CMHT (CMHT group) during the COVID-19 pandemic and two earthquakes.

Method: This is a cross-sectional survey administered among 90 participants with SMI at two time points: in May/June 2020 (first COVID-19 wave, earthquake) and in December 2020/January 2021 (second COVID-19 wave, earthquake).

Results: A significantly larger proportion of participants from the CMHT group visited the general practitioners in both waves of COVID-19 (first wave: CMHT 72.1%, TAU 44.2%, \(p = .009\); second wave: CMHT 91.1%, TAU 64.1%, \(p = .003\)), as well as psychiatric services in the second wave (CMHT 95.3%, TAU 79.5%, \(p = .028\)). The use of long-acting injectables was also more frequent in the CMHT group (\(p = .039\)). Furthermore, analysis of the first wave showed higher perceived support of significant others (\(p = .004\)) in the CMHT group. We did not identify any differences in mental health outcomes between groups in either wave.

Conclusions: While mental health outcomes did not differ between TAU and CMHT group, people in CMHT used services and treatments more frequently than those in TAU during the pandemic, which may indicate that CMHT services enable the continuity and accessibility of care for people with SMI under the circumstances where standard care is interrupted (for example pandemic, disaster conditions).

Keywords

COVID-19, severe mental illness, community mental health team, earthquake, crisis

Introduction

On March 11, 2020 the World Health Organization (WHO) declared the global SARS-CoV-2 virus a pandemic (World Health Organization, 2020a). To prevent the spread of the disease in the Republic of Croatia, as in other countries, special measures were introduced, including maintaining physical distance, using personal protective equipment and mandatory quarantine. Although these measures have shown a positive effect on reducing the spread of the virus (Brooks & Butler, 2021; Haug et al., 2020), they can also adversely impact mental health (Kozloff et al., 2020;
Rajkumar, 2020). According to the available data, people with schizophrenia and other severe mental illnesses (SMIs) are at a higher risk of getting infected, developing more severe symptoms related to COVID-19, as well as dying of COVID-19, compared to persons without SMI (Fond et al., 2021; Hassan et al., 2022; Karaoulanis & Christodoulou, 2021). The heightened vulnerability of persons with SMI has been attributed to several factors. For example, persons with SMI are more likely to be in a lower socioeconomic position and are thus hospitalized in facilities without adequate conditions for a pandemic, such as large number of beds per room, lack of proper sanitary conditions and smoking in rooms, which can facilitate the rapid spread of infectious diseases (Xiang et al., 2020). In addition, people with SMI more often have existing comorbidities, such as cardiovascular disease (Cohen, Christodoulou, 2017; Holt, 2015), which may increase the likelihood of complications or more severe forms of COVID-19 (Kozloff et al., 2020; Zhou, Yu, et al., 2020). In addition, lack of insight and impairments in decision-making capacity that can be associated with SMI may lead to difficulties in adapting and adhering to prescribed safeguarding measures (Kozloff et al., 2020). Therefore, a specific focus on the mental health of this population is important. This may prove as a difficult task, as many institutions and health care systems reduced routine medical procedures in response to the COVID-19 pandemic, likely leading to disadvantaging already marginalized patients, such as those with SMI (Kahl & Correll, 2020). Due to the multiplicity of factors that put these individuals at risk for COVID-19 infection and complications, as well as the massive impact of public health measures and associated changes in mental health care delivery (Shinn & Viron, 2020), bridging the treatment gaps and addressing the challenges in providing care to these patients is essential to maintain treatment success and reduce the risk of emergencies (Kahl & Correll, 2020).

The governmental response to the pandemic and consequently the organization of public measures and health care sectors varied and influenced the provision of mental health care (OECD/European Observatory on Health Systems and Policies, 2021). In the first wave of COVID-19 all psychiatric services, apart from the emergency service, were closed, leaving a gap in service provision for all patients, including those with SMIs (World Health Organization, 2020b; see also Roinic Kuzman et al., 2021). Namely, as patients with SMI usually require long term and consistent care, the interruption of care may have led to non-adherence to medication (including long acting injectables; LAI) and to relapse (Muruganandam et al., 2020; Mutlu & Anlí Yaşıcıoğlu, 2021; Zhou, Liu, et al., 2020). To overcome the interruption of services, psychiatric care switched to online (remote) care (Roinic Kuzman et al., 2021). In the second wave of COVID-19, regular psychiatric service re-opened, however the public restriction measures remained. In 2020, Croatia was also affected by a series of earthquakes, the strongest of which occurred on March 22nd in Zagreb during the first COVID-19 wave, and on December 29th in Petrinja, near Zagreb during the second COVID-19 wave.

Since 2018, the implementation and evaluation of community treatment in the form of community mental health teams (CMHTs) has been ongoing in Zagreb, Croatia and other sites in four other Central and Eastern European countries – Bulgaria, Northern Macedonia, Montenegro and Romania through the RECOVER-E project (LaRge-scale implementation of COmmunity based mental health care for people with seVere and Enduring mental ill health in EuRope; Shields-Zeeman et al., 2020; Wijnen et al., 2020). The project arose from the need to improve the quality of life and mental health outcomes of people with SMI through implementation of CMHTs (KBC Zagreb, 2022; Shields-Zeeman et al., 2020; Wijnen et al., 2020). The Zagreb and Petrinja earthquakes affected a large population as well as participants from the RECOVER-E study, since a majority of them resides in Zagreb (KBC Zagreb, 2022; Medved et al., 2022).

Since the COVID-19 pandemic and earthquakes had a significant impact on circumstances in Croatia, we wanted to understand the impact of the external shocks (COVID, earthquake) on mental health and perceived social support and healthcare utilization among people with SMI receiving treatment as usual (TAU) and additional care via a CMHT.

**Methods**

**Study design**

The study was conducted at the Department of Psychiatry and Psychological Medicine, University Hospital Centre (UHC) Zagreb from May 2020 until January 2021, as part of a larger randomized controlled hybrid effectiveness-implementation trial (the RECOVER-E project; see KBC Zagreb, 2022), which will be briefly explained here. More details of the larger study aims and design have been described elsewhere (Shields-Zeeman et al., 2020; Wijnen et al., 2020). The study reported herein entails a cross-sectional survey administered at two time points during the COVID-19 pandemic, that is, during the first and second pandemic wave.

**Participants**

Participants for this study were recruited from RECOVER-E project, for which they were consecutively recruited from December 2018 at the Department of Psychiatry and Psychological Medicine, if they met the eligibility criteria. Inclusion criteria for RECOVER-E trial were 18 to 65 years of age, an ICD-10 diagnosis of SMI...
(schizophrenia and other psychotic disorders, bipolar-affective disorder and major depressive disorder), and informed consent to participate in the research. Exclusion criteria were involuntary or mandatory psychiatric treatment. After signing informed consent, participants were randomized by an independent researcher with an 1:1 allocation ratio to a group receiving the standard treatment provided at the Department (treatment as usual, TAU group) or to a CMHT group that received outreach care based on flexible assertive community treatment principles (van Veldhuizen, 2007; see also Drukker et al., 2008) in addition to TAU. All participants previously involved in the RECOVER-E project were offered to participate in this additional research of the impact of the COVID-19 pandemic and the earthquake on mental health, and those who agreed to participate and gave an informed consent took part in the research.

Interventions

TAU. TAU consisted of inpatient treatment (based mainly on pharmacotherapy), a day hospital program (based mainly of supportive groups psychotherapy provided on a weekly basis) and outpatient treatment (outpatients come for regular medical examination/check-up once a month, or more often if necessary). A free telephone counselling line provided by trained psychiatrists and clinical psychologists was also available every day around-the-clock via a Crisis Intervention Centre run by the Department. Inpatient treatment lasted a maximum of 21 days, or 35 days if the patient received electroconvulsive therapy. Upon hospital discharge and according to their psychological condition, the patient is referred to either outpatient treatment or to a long-term care hospital (LTCH). However, lockdown measures implemented from March 2020 onwards resulted in the closing of almost all psychiatric services, apart from emergency care (Kuzman et al. 2020; Marko et al. 2020; Medved et al., 2022). Psychiatric care was reduced mainly to emergency services, as most outpatient and day hospital services significantly reduced the number of service users or switched to remote care, mostly based on telephone consultation. In the second wave, inpatient care at UHC Zagreb was completely detained, as due to the increase in number of COVID-19 cases since July 2020, many acute psychiatric wards within general or clinical hospitals were closed and transformed into COVID-19 units. That led to many patients being transferred to other, usually LTCHs, whereas day hospitals and outpatient units provided remote and reduced in-person care. In other words, different circumstances in providing TAU appeared, as TAU consisted mainly of emergency services in the first wave, whereas in the second wave altered outpatient care was provided, with the possibility of hospital-based care, but not in UHC Zagreb due to transformation into COVID-unit.

CMHT. Treatment within the CMHT was designed as providing additional services on top of TAU. The CMHT implemented in Zagreb is an interdisciplinary team consisting of four psychiatrists, one psychologist, 10 nurses and medical technicians, two social workers and four experts by experience (people who had recovered from SMI) with the task to provide integrated medical and social care based on FACT principles (van Veldhuizen, 2007; see also Drukker et al., 2008). CMHT members met at least twice a week to discuss how to provide the best personalized outreach care to each user. The treatment plan for every patient was made individually, according to the patient’s wishes and needs. Intervention visits done by CMHT usually lasted between 45 and 120 minutes each and were most often performed in the patient’s home. Frequency of visits depended on the patients’ needs and varied from every other day to bimonthly visits. Since March 2020, home visits were mostly replaced by online and telephone services, done on a regular basis by CMHT members. This had two implications. Consultations were shorter in duration and were offered in individual formats rather than in both individual and family formats. Although during summer 2020, home visits were re-introduced again, at the time of the second assessment (during December 2020), the majority of the CMHT members were placed on COVID-19 wards, which decreased their working time in the CMHT, although they remained available on remote services, thus different circumstances in providing CMHT applied in first and second COVID wave.

Ethics

This research was approved by the Ethics Committee of UHC Zagreb on May 4th, 2020 as an extension of RECOVER-E (Class: 8.1-18/149-2, Number: 02/21 AG). At any time, participants could withdraw from the research. Data on participants were used in accordance with the regulations on personal data in clinical research according to Resolution no. 52 of July 24th 2008. OJ n.190 of August 14th 2008 and in accordance with the regulations of General Data Protection Regulation EU 2016/679, that is, each participant was assigned a three-digit number that represents an identification mark on all questionnaires and all data are marked with the assigned code.

Procedure

For the purpose of this study, all participants were interviewed by researchers via telephone administered survey at two time points: the first measurement was done in May and June 2020 during the first COVID-19 wave and the Zagreb earthquake. The second measurement was done in late December 2020 and January 2021 during the second COVID-19 wave and the Petrinja earthquake. The overall survey took around 30 minutes to complete.
Tools and measures

Socio-demographic data. Socio-demographic data included age, sex, marital status, education, current employment, size and the structure of the household.

Medical data. This contained information about whether a participant has been in quarantine or contracted COVID-19 disease at the moment of the survey, the leading psychiatric diagnosis, prescribed medications and the presence of other co-morbid disorders.

Perceived impact. Participants were asked to indicate the perceived impact of the COVID-19 pandemic on a) their life, b) mental illness, and c) overall fear. Responses ranged from ‘not at all’ to ‘extremely’ on a 5-point Likert scale.

Mental health was measured by (1) Insomnia, (2) depression, anxiety and stress symptoms severity.

Insomnia. Severity of insomnia symptoms was assessed using the Insomnia Severity Index (ISI; Morin et al., 2011). The ISI is a seven-item questionnaire that assesses the quality of sleep in the past 2 weeks. The following dimensions are evaluated: difficulties falling asleep, sleep maintenance, early morning awakening problems, sleep dissatisfaction, interference of sleep difficulties with daytime functioning and quality of life and distress caused by the sleep difficulties. A 5-point Likert scale (0–4) is used to rate each item, according to the severity of the problem. The total score ranges from 0 to 28, and higher scores indicate greater sleep difficulties. Patients can be classified into four groups: no clinically significant insomnia (0–7 points), subthreshold insomnia (8–14 points), clinical insomnia of moderate severity (15–21 points), and severe clinical insomnia (22–28 points).

Depression, anxiety and stress. The Depression Anxiety Stress Scale-21 (DASS-21; Lovibond & Lovibond, 1995) was used for assessing symptoms of depression, anxiety and stress. DASS-21 has 21 items rated from 0 (did not apply to me at all) to 3 (applied to me almost completely or most of the time). All three subscales have a set of seven items. The depression subscale contains items related to hopelessness, depressed mood, feeling worthless of life, lack of interest and involvement in daily activities, anhedonia and ideas of guilt. Anxiety is assessed by items about physical changes in the body, anxiety related to different life situations and subjective experience of fear. Stress is assessed by items about tension, irritability, and overreaction. As the DASS-21 is a short-form version of the DASS (42 items; Lovibond & Lovibond, 1995), the final score for each subscale is multiplied by two and evaluated according to its severity rating index into four severity ranges: mild, moderate, severe and extremely severe. The proposed cut off scores are as follows: for depression – normal (0–9), mild (10–13), moderate (14–20), severe (21–27), extremely severe (28+); for anxiety – normal (0–7), mild (8–9), moderate (10–14), severe (15–19), extremely severe (20+); and for stress – normal (0–14), mild (15–18), moderate (19–25), severe (26–33), extremely severe (34+).

Perceived social support. The Multidimensional Scale of Perceived Social Support (MSPSS; Zimet et al., 1988) is a 12-item scale designed to measure perceived social support from three sources: family, friends, and a significant other. There are four items for each source of social support. On a scale from 1 (I do not agree at all) to 7 (I completely agree), the participant indicates the degree that best suits real life. Subscales (support from family, friends and others) are scored separately. The mean score for each subscale is calculated by summing across items from that subscale and then dividing by 4, with the score range from 1 to 7. Therefore, a score of 1 to 2.9 indicates low support, 3–5 moderate, and a score 5.1 to 7 high perceived social support.

Healthcare utilization. Participants were asked about utilization of medical services. More specifically, they were asked if they had used any of the following medical services during the ongoing wave: emergency room (ER), general practitioner (GP), psychiatrist, other specialties, and for any of the following reasons: worsening of psychiatric symptoms, application of LAIs, deterioration of physical condition. They were asked about being admitted to inpatient treatment during the ongoing wave.

Study outcomes

The primary outcome of the study was the difference in mental health outcomes between the CMHT and TAU groups in the first and second wave of COVID-19. The secondary outcome was the analysis of the difference in the perceived social support and healthcare utilization between the groups in the first and second wave of COVID-19.

Primary and secondary outcomes from the first and second wave were not compared directly, because of above described significantly different circumstances in providing health care services in these two waves in both CMHT and TAU group, which could have impacted outcomes of this study.

Statistical analysis

Descriptive analysis was used for sample description. Scores on the DASS-21, ISI and MSPSS were categorized, following the proposed cut off scores. Pearson X² was used for assessing differences between the two groups on outcomes of mental health and insomnia, as well as on perceived social support and healthcare utilization, separately.
at the two assessment points. Since DASS-21 and ISI are used for measuring symptoms of depression, anxiety, stress and insomnia that are not necessarily stress-related, we wanted to further assess correlation between these symptoms and self-perceived impact of COVID-19. To assess the correlation of the participants’ self-assessment of the impact of COVID-19 and results of the DASS-21 and ISI scores during the two assessment points, Spearman correlation was used. The results were interpreted at the 5% significance level ($\alpha = .05$). The statistical program STATA/IC 16, Stata Corp LLC was used for statistical analysis (StataCorp LLC, 2019).

**Results**

**Participants**

We recruited 47 participants from the CMHT and 43 from TAU ($N=90$). Six of those dropped out at the second assessment (two from CMHT and four from TAU).

Table 1 shows the sociodemographic and clinical features of the participants involved in this study. There was no statistically significant difference between CMHT and TAU group (Table 1), except in the use of LAIs ($X^2$ (1, $N=84$) = 4.28, $p = .039$). At first assessment, no participant got infected with COVID-19, but one was self-isolated due to contact with an infected person, whereas at the second assessment, there was one participant infected with COVID-19 and three self-isolated.

Table 1. Sociodemographic and clinical features of participants in the sample.

| Characteristics                          | CMHT         | TAU          |
|------------------------------------------|--------------|--------------|
| **Male**                                 | 18 (38.3)    | 21 (48.8)    |
| **Age (years), mean (SD)**               | 41.0 (12.7)* | 42.7 (16.6)* |
| **Single/divorced**                      | 32 (68.1)    | 30 (69.8)    |
| **Employed**                             | 11 (23.4)    | 9 (22.0)     |
| **Finished high school**                 | 44 (93.6)    | 35 (87.5)    |
| **Living alone**                         | 7 (14.9)     | 5 (11.6)     |
| **Mean number of persons in household (SD)** | 2.8 (1.2)*  | 2.7 (1.4)*   |
| **Mean number of children in household (SD)** | 0.4 (0.8)*  | 0.2 (0.5)*   |
| **Psychiatric diagnosis**                |              |              |
| Schizophrenia and other psychotic disorders | 32 (68.1) | 31 (72.1) |
| Major depressive disorder                | 11 (23.4)    | 8 (18.6)     |
| Bipolar-affective disorder               | 4 (8.5)      | 4 (9.3)      |
| **Medication**                           |              |              |
| Antipsychotics                           | 42 (89.4)    | 37 (88.1)    |
| Long acting injectable antipsychotics (LAIs) | 16 (37.2) | 7 (17.1) |
| Mood stabilizers                         | 17 (36.2)    | 9 (21.4)     |
| Antidepressants                          | 14 (29.8)    | 20 (47.6)    |
| Sedatives                                | 29 (61.7)    | 27 (64.3)    |
| Co-morbid somatic disorders              | 21 (44.7)    | 21 (48.8)    |

*a* unless otherwise specified.

**Mental health and impact of COVID-19**

Table 2 shows the assessment of the severity of participants’ symptoms of depression, anxiety and stress, along with symptoms of insomnia. We did not identify any differences in the symptoms’ severity scores between two groups in any of the tested variables.

In Figure 1, the participants’ perception of the impact of COVID-19 on their life, mental illness and fear is presented, with responses ranging from ‘not at all’ to ‘extremely’ on a 5-point Likert scale.

In our sample, we found significant positive correlations between DASS-21 score and fear of COVID-19 (first assessment: $r = .36$, $p < .001$, second assessment: $r = .53$, $p < .001$), perceived impact of the COVID-19 pandemic on life (first assessment: $r = .42$, $p < .001$, second assessment: $r = .54$, $p < .001$) and perceived impact of COVID-19 pandemic on mental illness (first assessment: $r = .46$, $p < .001$, second assessment: $r = .56$, $p < .001$). ISI scores were found to be significantly associated only in the second assessment with fear of COVID-19 ($r = .28$, $p = .011$), perceived influence of COVID-19 pandemic on life ($r = .34$, $p = .002$) and on perceived impact of COVID-19 pandemic on mental illness ($r = .34$, $p = .002$). These correlations were weaker and did not reach statistical significance in the first assessment (fear of COVID-19: $r = .14$, $p = .186$; perceived influence on life: $r = .16$, $p = .123$; perceived influence on mental illness: $r = .20$, $p = .061$).
Table 2. Assessment of the severity of symptoms.

| Feature                  | First assessment | Second assessment |
|--------------------------|------------------|-------------------|
|                          | CMHT*            | TAU*              | CMHT*            | TAU*              |
|                          | X² (df, N) = test value, p |                  | X² (df, N) = test value, p |                  |
| Depression (DASS-21)     |                  |                   |                  |                   |
| Normal                   | 24 (51.1)        | 22 (52.4)         | 20 (45.5)        | 25 (64.1)         |
| Mild                     | 7 (14.9)         | 3 (7.1)           | 4 (9.1)          | 3 (7.7)           |
| Moderate                 | 3 (6.4)          | 4 (9.5)           | 6 (13.6)         | 5 (12.8)          |
| Severe                   | 6 (12.8)         | 4 (9.5)           | 8 (18.2)         | 3 (7.7)           |
| Extremely severe         | 7 (14.9)         | 9 (21.4)          | 6 (13.6)         | 3 (7.7)           |
| Anxiety (DASS-21)        |                  |                   |                  |                   |
| Normal                   | 25 (53.2)        | 21 (50.0)         | 19 (43.2)        | 22 (56.4)         |
| Mild                     | 3 (6.4)          | 6 (14.3)          | 3 (6.8)          | 2 (5.1)           |
| Moderate                 | 5 (10.6)         | 6 (14.3)          | 8 (18.2)         | 8 (20.5)          |
| Severe                   | 4 (8.5)          | 2 (4.8)           | 4 (9.1)          | 2 (5.1)           |
| Extremely severe         | 10 (21.3)        | 7 (16.7)          | 10 (22.7)        | 5 (12.8)          |
| Stress (DASS-21)         |                  |                   |                  |                   |
| Normal                   | 27 (57.4)        | 25 (59.5)         | 23 (52.3)        | 24 (61.5)         |
| Mild                     | 5 (10.6)         | 3 (7.1)           | 4 (9.1)          | 2 (5.1)           |
| Moderate                 | 7 (14.9)         | 3 (7.1)           | 7 (15.9)         | 8 (20.5)          |
| Severe                   | 4 (8.5)          | 5 (11.9)          | 6 (13.6)         | 3 (7.7)           |
| Extremely severe         | 4 (8.5)          | 6 (14.3)          | 4 (9.1)          | 2 (5.1)           |
| Insomnia (ISI)           |                  |                   |                  |                   |
| No clinically significant insomnia | 27 (57.4) | 33 (76.7) | X² (3, N = 90) = 5.50, p = .139 | 18 (40.9) | 24 (61.5) | X² (3, N = 83) = 3.87, p = .276 |
| Subthreshold insomnia   | 11 (23.4)        | 4 (9.3)           | 14 (31.8)        | 8 (20.5)          |
| Clinical insomnia (moderate severity) | 7 (14.9) | 3 (7.0) | 10 (22.7) | 5 (12.8) |
| Clinical insomnia (severe) | 2 (4.3)        | 3 (7.0) | 2 (4.5) | 2 (5.1) |

*N (%).

Figure 1. Participants’ self-assessment of the impact of COVID-19 at the first and second assessment.
Perceived social support

Data on MSPSS score for the whole sample in both assessments is presented in Figure 2. When comparing the perceived social support, analysis of the first assessment showed higher perceived support of significant others in the CMHT group ($X^2 [2, N=86] = 10.96, p = .004$). No difference in perceived social support was observed in the second assessment.

Healthcare utilization

Data on the use of medical services are presented in Table 3. There was no significant difference between the two groups in the first assessment, except in the frequency of visits to the general practitioners (GPs), where subjects from the CMHT group visited their GPs more frequently ($p = .009$). In the second assessment, significantly more subjects from the CMHT group visited their GPs ($p = .003$) and psychiatry service ($p = .028$).

Discussion

The aim of the study was to evaluate differences between patients with SMI receiving TAU or additional care through CMHT services on mental health outcomes, perceived social support and healthcare utilization in the contexts of the first and second wave of the COVID-19 and coincidental earthquakes.

Our study showed that mental health outcomes did not differ between people receiving treatment as usual or care through the CMHT in either wave, specifically symptoms of depression, anxiety, stress and insomnia. Our results on mental health outcomes are mainly consistent with other studies investigating depression, anxiety, stress and other psychological symptoms in the general population (Hao et al., 2020; Mautong et al., 2021; Salari et al., 2020), regardless of studied group population (TAU or CMHT). Furthermore, most participants did not have a significant fear of COVID-19 in the first assessment, which is consistent with the results of other studies with persons with SMI (Muruganandam et al., 2020), although the fear of COVID-19 intensified over the time. According to published studies, the fear of COVID-19 disease seems to be similar or a bit lower compared to the general population (Buljan Flander et al., 2020; Roy et al., 2020; Wolf et al., 2020). The explanation for this may be a greater focus to the internal than external reality in persons with SMI and the existence of social isolation in patients due to the mental illness itself (Slade, 2010). On the other hand, in our study we found that half of participants noted how a pandemic affects their lives in general, while about 40% noted how it affects their mental health, which is result that is consistent with studies in the general population (Barrafrem et al., 2020).

Perceived social support was significant for 57% of participants in the first wave and 69.5% of them in the second wave of the pandemic. High social support can provide an explanation for relatively common mental health outcomes of our sample, that is not worse when comparing our results to aforementioned other similar researches on general population (Hao et al., 2020; Mautong et al., 2021; Salari et al., 2020), despite significant exogenous stressors such as
pandemic and earthquakes (Margetić et al., 2021). Furthermore, the higher scores on the MSPSS scale in the CMHT group of the ‘significant others’ in the first wave indicated higher perceived social support and greater social support network by other than family members. Indeed, as CMHTs were formed at University Hospital Centre Zagreb in the summer of 2018, there was enough time for experts and clients to establish a therapeutic relationship through in-person meetings and home visits; the same relationship continued through telephone contacts during the pandemic.

When it comes to healthcare utilization, our results have shown that there were significant differences between the group receiving the TAU and the group treated with additional CMHT during the first and second wave of the COVID-19 pandemic. The health care seems to have been far more accessible to the participants in the CMHT group, as they were more likely to see a GP and more frequently received the LAIs. On the other side, the percentages of hospitalization in the TAU group due to worsening of symptoms during the first wave was twice as high than in the CMHT, although it did not reach statistical significance due to the low number of cases. This result may possibly indicate a higher relapse rate among patients treated by standard treatment in the situation when most psychiatric services were disrupted. During the first wave of COVID-19, the health professionals from CMHTs arranged LAIs application in the GP’s office, since hospital services were difficult to access. Patients in the TAU did not have such treatment as they did not receive CMHT services and underwent standard psychiatric treatment that was reduced mainly to emergency care in the period of the first wave. This was also evident in the second wave of the pandemic, where the patients in the CMHT group were more likely to visit GPs as well as psychiatrists, possibly indicating higher adherence to treatment. As low adherence to treatment is a strong risk factor of relapse (Haywood et al., 1995; Mi et al., 2020), it is possible that this intervention is a protective factor against relapses in the near future (Wang et al., 2014).

When looking at the whole sample, as many as 58.9% participants in our research sought psychiatric help during the first wave of the pandemic and Zagreb earthquake, and 15.9% were hospitalized in the same period due to worsening of psychiatric symptoms.

Table 3. The use of medical services during the COVID-19 pandemic.

| The use of medical services and reasons for visit | First assessment |  | Second assessment |  |
|-------------------------------------------------|------------------|------------------|------------------|------------------|
|                                                 | CMHT* TAU* X2 (df, N)= test value, p | CMHT* TAU* X2 (df, N)= test value, p |
| Emergency setting                                |                  |                  |                  |
| Worsening of psychiatric symptoms               | 7 (15.6) 6 (14.0) | X2 (1, N=88)=0.04, p=.832 | 12 (27.3) 8 (20.5) | X2 (1, N=83)=0.52, p=.472 |
| Application of LAIs                             | 4 (8.9) 2 (4.7)  | 5 (11.4) 3 (7.7) |
| Deterioration of physical condition             | 1 (2.2) 0 (0.0)  | 1 (2.3) 1 (2.6)  | 0 (0.0) 3 (7.0)  | 5 (11.4) 3 (7.7) |
| Hospital treatment                               | 4 (8.9) 10 (23.3) | X2 (1, N=88)=3.39, p=.065 | 10 (22.2) 10 (25.6) | X2 (1, N=84)=0.13, p=.714 |
| Worsening of psychiatric symptoms               | 4 (8.9) 10 (23.3) | 9 (20.0) 6 (15.4) |
| Deterioration of physical condition             | 0 (0.0) 0 (0.0)  | 1 (2.2) 3 (7.7)  |
| General practitioners                            | 31 (72.1) 19 (44.2) | X2 (1, N=86)=6.88, p=.009 | 41 (91.1) 25 (64.1) | X2 (1, N=84)=9.05, p=.003 |
| Worsening of psychiatric symptoms               | 1 (2.3) 1 (2.3)  | 3 (6.7) 1 (2.6)  |
| Application of LAIs                             | 15 (34.9) 5 (11.6) | 25 (55.6) 13 (33.3) |
| Deterioration of physical condition             | 8 (18.6) 13 (30.2) | 8 (17.8) 8 (20.5) |
| Psychiatry service                               | 24 (51.1) 29 (67.4) | X2 (2, N=90)=3.70, p=.157 | 41 (95.3) 31 (79.5) | X2 (1, N=82)=4.81, p=.028 |
| Worsening of psychiatric symptoms               | 3 (6.4) 1 (2.3)  | 4 (9.3) 5 (12.8)  |
| Application of LAIs                             | 2 (4.3) 0 (0.0)  | 2 (4.7) 0 (0.0)  |
| Regular visit                                    | 15 (32.0) 26 (60.5) | 33 (76.7) 22 (56.4) |
| Other specialized care                           | 11 (25.0) 11 (25.6) | X2 (1, N=87)=0.004, p=.950 | 17 (38.6) 21 (56.8) | X2 (1, N=81)=2.65, p=.104 |

*N (%).

When it comes to healthcare utilization, our results have shown that there were significant differences between the group receiving the TAU and the group treated with additional CMHT during the first and second wave of the COVID-19 pandemic. The health care seems to have been far more accessible to the participants in the CMHT group, as they were more likely to see a GP and more frequently received the LAIs. On the other side, the percentages of hospitalization in the TAU group due to worsening of symptoms during the first wave was twice as high than in the CMHT, although it did not reach statistical significance due to the low number of cases. This result may possibly indicate a higher relapse rate among patients treated by standard treatment in the situation when most psychiatric services were disrupted. During the first wave of COVID-19, the health professionals from CMHTs arranged LAIs application in the GP’s office, since hospital services were difficult to access. Patients in the TAU did not have such treatment as they did not receive CMHT services and underwent standard psychiatric treatment that was reduced mainly to emergency care in the period of the first wave. This was also evident in the second wave of the pandemic, where the patients in the CMHT group were more likely to visit GPs as well as psychiatrists, possibly indicating higher adherence to treatment. As low adherence to treatment is a strong risk factor of relapse (Haywood et al., 1995; Mi et al., 2020), it is possible that this intervention is a protective factor against relapses in the near future (Wang et al., 2014). When looking at the whole sample, as many as 58.9% participants in our research sought psychiatric help during the first wave of the pandemic and Zagreb earthquake, and 15.9% were hospitalized in the same period due to worsening of psychiatric symptoms.

Table 3. The use of medical services during the COVID-19 pandemic.

| The use of medical services and reasons for visit | First assessment |  | Second assessment |  |
|-------------------------------------------------|------------------|------------------|------------------|------------------|
|                                                 | CMHT* TAU* X2 (df, N)= test value, p | CMHT* TAU* X2 (df, N)= test value, p |
| Emergency setting                                |                  |                  |                  |
| Worsening of psychiatric symptoms               | 7 (15.6) 6 (14.0) | X2 (1, N=88)=0.04, p=.832 | 12 (27.3) 8 (20.5) | X2 (1, N=83)=0.52, p=.472 |
| Application of LAIs                             | 4 (8.9) 2 (4.7)  | 5 (11.4) 3 (7.7) |
| Deterioration of physical condition             | 1 (2.2) 0 (0.0)  | 1 (2.3) 1 (2.6)  | 0 (0.0) 3 (7.0)  | 5 (11.4) 3 (7.7) |
| Hospital treatment                               | 4 (8.9) 10 (23.3) | X2 (1, N=88)=3.39, p=.065 | 10 (22.2) 10 (25.6) | X2 (1, N=84)=0.13, p=.714 |
| Worsening of psychiatric symptoms               | 4 (8.9) 10 (23.3) | 9 (20.0) 6 (15.4) |
| Deterioration of physical condition             | 0 (0.0) 0 (0.0)  | 1 (2.2) 3 (7.7)  |
| General practitioners                            | 31 (72.1) 19 (44.2) | X2 (1, N=86)=6.88, p=.009 | 41 (91.1) 25 (64.1) | X2 (1, N=84)=9.05, p=.003 |
| Worsening of psychiatric symptoms               | 1 (2.3) 1 (2.3)  | 3 (6.7) 1 (2.6)  |
| Application of LAIs                             | 15 (34.9) 5 (11.6) | 25 (55.6) 13 (33.3) |
| Deterioration of physical condition             | 8 (18.6) 13 (30.2) | 8 (17.8) 8 (20.5) |
| Psychiatry service                               | 24 (51.1) 29 (67.4) | X2 (2, N=90)=3.70, p=.157 | 41 (95.3) 31 (79.5) | X2 (1, N=82)=4.81, p=.028 |
| Worsening of psychiatric symptoms               | 3 (6.4) 1 (2.3)  | 4 (9.3) 5 (12.8)  |
| Application of LAIs                             | 2 (4.3) 0 (0.0)  | 2 (4.7) 0 (0.0)  |
| Regular visit                                    | 15 (32.0) 26 (60.5) | 33 (76.7) 22 (56.4) |
| Other specialized care                           | 11 (25.0) 11 (25.6) | X2 (1, N=87)=0.004, p=.950 | 17 (38.6) 21 (56.8) | X2 (1, N=81)=2.65, p=.104 |

*N (%).
to worsening of psychiatric symptoms. In the second wave, 87.8% of all participants sought psychiatric help and 17.9% were hospitalized due to worsening of psychiatric symptoms. These data indicate a trend of increased mental distress leading to deterioration of mental status over time, similarly to what was found among the general population (Babicki et al., 2021).

Limitations

There are several limitations of this study. First, there is no data before the outbreak of the pandemic and earthquake using the same standardized scales in Croatia, and therefore it cannot be confirmed that the results on the used assessment scales are a direct result of the influence of COVID-19 pandemic and earthquakes. However, we found a high correlation between the self-assessed impact of COVID-19 on life and mental illness and results of the used standardized scales assessing mental health. Second, the assessments relied on self-reporting may potentially cause over- or under-reporting. The self-reported measures have limited accuracy compared to an interview conducted by a psychiatrist. Third, the long term effects of the COVID-19 pandemic is not addressed, as some of the effects of the disruption of the mental health care may become evident after a longer period.

Conclusion

CMHTs are a relatively new form of specialized mental health care for treating people with SMI in Croatia and their implementation in the health system has been carried out through the RECOVER-E project. The prior assumption of this paper that CMHTs would have a greater protective effect against mental distress of people suffering from SMI at the time of the pandemic compared to treatment as usual was partially confirmed. While the CMHT group had more in-formal health care support compared to the usual services, which was evident in the first wave of COVID-19, the mental health was not different between groups in either wave. Also, CMHT could connect the psychiatric service with general practitioners allowing patients the continuation of LAI's in GP's offices, which is of great importance in the period of pandemic when visits were extremely difficult to access, and in some periods almost impossible. Thus, our results may indicate that CMHT services enabled the continuity and accessibility of care for people with SMI under the circumstances where standard care is interrupted (for example, pandemic, disaster conditions). Concordantly, a higher rate of hospitalizations due to relapse, even though not statistically significant, was seen in the control group compared to the intervention one in the first wave. Although there was no difference in the intensity of mental problems among patient's groups, it is possible that some of the effects of the disruption of the standard mental health care may become evident after a longer period.

Author contributions

SL. participated in the project and in the study, has written the first draft of the study, gave critically relevant comments, revised the study and approved the final version of it. LT, KB and JG participated in the project and in the study, participated in the writing of the first draft of the manuscript, gave critically relevant comments in the revised version of the manuscript study and approved the final version of it. SM participated in the project and in the study, revised the first draft of the study, gave critically relevant comments, and approved the final version. LSZ and FB were the coordinators of the project, gave critically relevant comments and participated in the writing of the manuscript and approved the final version of it. MRK participated in the project and in the study, revised the first draft of the study, and gave critically relevant comments on the subsequent revisions of the manuscript and approved the final version of it.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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References

Babicki, M., Kowalski, K., Bogudzińska, B., & Mastalerz-Migas, A. (2021). Impact of the COVID-19 pandemic on mental well-being. A nationwide online survey covering three pandemic waves in Poland. Frontiers in Psychiatry, 12, 804123. https://doi.org/10.3389/fpsyt.2021.804123
Barrafarm, K., Västfjäll, D., & Tinghög, G. (2020). Financial well-being, COVID-19, and the financial better-than-average-effect. Journal of Behavioral and Experimental Finance, 28, 100410. https://doi.org/10.1016/j.jbef.2020.100410
Brooks, J. T., & Butler, J. C. (2021). Effectiveness of mask wearing to control community spread of SARS-CoV-2. JAMA, 325(10), 998–999. https://doi.org/10.1001/jama.2021.1505
Buljan Flander, G., Galić, R., Roje Đapić, M., Raguž, A., & Prijatelj, K. (2020). Zaštitni i rizični čimbenici u prilagodbi na pandemiju COVID-19 u Republici Hrvatskoj. Socijalna psihijatrija, 48(3), 285–300. https://doi.org/10.24869/spsih.2020.285
Cohen, A. (2017). Addressing comorbidity between mental disorders and major noncommunicable diseases: background technical report to support implementation of the WHO
European Mental Health Action Plan 2013–2020 and the WHO European Action Plan for the Prevention and Control of Noncommunicable Diseases 2016–2025. World Health Organization, Regional Office for Europe. https://apps.who.int/iris/handle/10665/344119

Drukker, M., Maarschalkerweerd, M., Bak, M., Dreissen, G., áCampo, J., de Bie, A., Poddighe, G., von Os, J., & Delespaul, P. (2008). A real-life observational study of the effectiveness of FACT in a Dutch mental health region. BMC Psychiatry, 8, 93. https://doi.org/10.1186/1471-244X-8-93

Fond, G., Nemani, K., Etchecopar-Etchart, D., Loundou, A., Kravitz, H. M., Grossman, L. S., Cavanaugh, J., Hao, F., Tan, W., Jiang, L., Zhang, L., Zhao, X., Zou, Y., Hu, Y., Luo, X., Jiang, X., McIntyre, R. S., Tran, B., Sun, J., Zhang, Z., Ho, R., Ho, C., & Tam, W. (2020). Do psychiatric patients experience more psychiatric symptoms during COVID-19 pandemic and lockdown? A case-control study with service and research implications for immunopsychiatry. Brain, Behavior, and Immunity, 87, 100–106. https://doi.org/10.1016/j.bbi.2020.04.069

Hassan, L., Peek, N., Lovell, K., Carvalho, A. F., Solmi, M., Stubbs, B., & Firth, J. (2022). Disparities in COVID-19 infection, hospitalisation and death in people with schizophrenia, bipolar disorder, and major depressive disorder: A cohort study of the UK Biobank. Molecular Psychiatry, 27(2), 1248–1255. https://doi.org/10.1038/s41380-021-01344-2

Haug, N., Geyrhofer, L., Londei, A., Dervic, E., Desvars-Larrive, A., Loreto, V., Pinior, B., Thurner, S., & Klimek, P. (2020). The “revolving door” phenomenon among patients with schizophrenia, schizoaffective, and affective disorders. The American Journal of Psychiatry, 152(6), 856–861. https://doi.org/10.1176/appi.ajp.152.6.856

Holt, R. I. G. (2015). Cardiovascular disease and severe mental illness. In N. Sartorius, R. I. G. Holt & M. Maj (Eds.), Comorbidity of Mental and Physical Disorders. Key Issues Ment Health. (Vol. 179, pp. 54–65). Karger. https://doi.org/10.1159/000365531

Kahl, K. G., & Correll, C. U. (2020). Management of patients with severe mental illness during the coronavirus disease 2019 pandemic. JAMA Psychiatry, 77(9), 977–978. https://doi.org/10.1001/jamapsychiatry.2020.1701

Karoaulis, S. E., & Christodoulou, N. G. (2021). Do patients with schizophrenia have higher infection and mortality rates due to COVID-19? A systematic review. Psychiatrike = Psychiatriki, 32(3), 219–223. https://doi.org/10.22365/jpsych.2021.027

KBC Zagreb. (2022). RECOVER-E-project [Internet]. Retrieved January 9, 2022, from https://www.kbc-zagreb.hr/recover-e-projekt.aspx

Kozloff, N., Mulsant, B. H., Stergiopoulos, V., & Voinoskos, A. N. (2020). The COVID-19 global pandemic: Implications for people with schizophrenia and related disorders. Schizophrenia Bulletin, 46(4), 752–757. https://doi.org/10.1093/schbul/sbaa051

Kuzman, M. R., Curkovic, M., & Wasserman, D. (2020). Principles of mental health care during the COVID-19 pandemic. European Psychiatry: The Journal of the Association of European Psychiatrists, 63(1), e45. https://doi.org/10.1192/j.eurpsy.2020.54

Lovibond, S. H., & Lovibond, P. F. (1995). Manual for the depression anxiety & stress scales (2nd ed.). Psychology Foundation.

Margetic, B., Perica, T., Stojanovic, K., & Ivanec, D. (2021). Predictors of emotional distress during the COVID-19 pandemic: A Croatian study. Personality and Individual Differences, 175, 110691. https://doi.org/10.1016/j.paid.2021.110691

Marko, C., Košec, A., & Brecic, P. (2020). Stay home while going out - Possible impacts of earthquake co-occurring with COVID-19 pandemic on mental health and vice versa. Brain, Behavior, and Immunity, 87, 82–83. https://doi.org/10.1016/j.bbi.2020.04.054

Mautong, H., Gallardo-Rumbea, J. A., Alvarado-Villa, G. E., Fernández-Cadena, J. C., Andrade-Molina, D., Orellana-Román, C. E., & Cherrez-Ojeda, I. (2021). Assessment of depression, anxiety and stress levels in the Ecuadorian general population during social isolation due to the COVID-19 outbreak: A cross-sectional study. BMC Psychiatry, 21, 212. https://doi.org/10.1186/s12888-021-03214-1

Medved, S., Imširagić, A. S., Salopek, I., Puljić, D., Handl, H., Kovač, M., Peša, A. M., Štimac Gribić, D., Romančuk, L., Mužič, R., Zeeman, L. S., & Kuzman, M. R. (2022). Case series: Managing severe mental illness in disaster situation: the croatian experience after 2020 earthquake. Frontiers in Psychiatry, 12, 795661. https://doi.org/10.3389/fpsyg.2021.795661

Mi, W. F., Chen, X. M., Fan, T. T., Tabarak, S., Xiao, J. B., Cao, Y. Z., Li, X. Y., Bao, Y. P., Han, Y., Li, L. Z., Shi, Y., Guo, L. H., Wang, X. Z., Liu, Y. Q., Wang, Z. M., Chen, J. X., Wu, F. C., Ma, W. B., Li, H. F., . . . , Lu, L. (2020). Identifying modifiable risk factors for relapse in patients with schizophrenia in China. Frontiers in Psychiatry, 11, 574763. https://doi.org/10.3389/fpsyg.2020.574763

Morin, C. M., Belleville, G., Bélanger, L., & Ivers, H. (2011). The insomnia severity index: Psychometric indicators to detect insomnia cases and evaluate treatment response. Sleep, 34(5), 601–608. https://doi.org/10.1093/sleep/34.5.601

Muruganandam, P., Neelamegam, S., Menon, V., Alexander, J., & Chaturvedi, S. K. (2020). COVID-19 and severe mental illness: Impact on patients and its relation with their awareness about COVID-19. Psychiatry Research, 291, 113265. https://doi.org/10.1016/j.psychres.2020.113265

Mutlu, E., & Anıl Yağcıoğlu, A. E. (2021). Relapse in patients with serious mental disorders during the COVID-19 outbreak: A retrospective chart review from a community mental health center. European Archives of Psychiatry and Clinical Neuroscience, 271(2), 381–383. https://doi.org/10.1007/s00406-020-01203-1
Levaj et al.

OECD/European Observatory on Health Systems and Policies. (2021). *Country Health Profile 2021*. State of Health in the EU, OECD Publishing, Paris/European Observatory on Health Systems and Policies, Brussels. https://www.oecd.org/countries/croatia/croatia-country-health-profile-2021-717e5510-en.htm

Rajkumar, R. P. (2020). COVID-19 and mental health: A review of the existing literature. *Asian Journal of Psychiatry, 52*, 102066. https://doi.org/10.1016/j.ajp.2020.102066

Rojnic Kuzman, M., Vahip, S., Fiorillo, A., Beezhold, J., Pinto da Costa, M., Skugarevsky, O., Dom, G., Pajevic, I., Peles, A. M., Mohr, P., Kleinberg, A., Chkonia, E., Balazs, J., Flannery, W., Mazalaiuskiene, R., Chihai, J., Samochowiec, J., Cozman, D., Mihajlovic, G., . . . Goorwod, P. (2021). Mental health services during the first wave of the COVID-19 pandemic in Europe: Results from the EPA ambassadors survey and implications for clinical practice. *European Psychiatry: The Journal of the Association of European Psychiatricists, 64*(1), e41. https://doi.org/10.1192/j.eurpsy.2021.2215

Roy, D., Tripathy, S., Kar, S. K., Sharma, N., Verma, S. K., & Kaushal, V. (2020). Study of knowledge, attitude, anxiety & perceived mental healthcare need in Indian population during COVID-19 pandemic. *Asian Journal of Psychiatry, 51*, 102083. https://doi.org/10.1016/j.ajp.2020.102083

Salari, N., Hosseinian-Far, A., Jalali, R., Vaisi-Raygani, A., Rasoulopour, S., Mohammadi, M., Rasoulopour, S., & Khaledi-Paveh, B. (2020). Prevalence of stress, anxiety, depression among the general population during the COVID-19 pandemic: A systematic review and meta-analysis. *Globalization and Health, 16*(1), 57. https://doi.org/10.1186/s12992-020-00589-w

Shields-Zeeman, L., Petrea, I., Smit, F., Walters, B. H., Dedovic, J., Kuzman, M. R., Nakov, V., Nica, R., Novotni, A., Roth, C., Tomcuk, A., Wijnen, B., & Wensing, M. (2020). Towards community-based and recovery-oriented care for severe mental disorders in Southern and Eastern Europe: Aims and design of a multi-country implementation and evaluation study (RECOVER-E). *International Journal of Mental Health Systems, 14*, 30. https://doi.org/10.1186/s13033-020-00361-y

Shinn, A. K., & Viron, M. (2020). Perspectives on the COVID-19 pandemic and individuals with serious mental illness. *The Journal of Clinical Psychiatry, 81*(3), 20com13412. https://doi.org/10.4088/JCP.20com13412

Slade, M. (2010). Mental illness and well-being: The central importance of positive psychology and recovery approaches. *BMJ Health Services Research, 10*, 26. https://doi.org/10.1186/1472-6963-10-26

StataCorp LLC. (2019). *Stata Statistical Software: Release 16*. College Station.

doi.org/10.1007/s10597-007-9089-4

van Veldhuizen, J. R. (2007). FACT: A Dutch version of ACT. *Community Mental Health Journal, 43*(4), 421–433. https://doi.org/10.1007/s10597-007-9089-4

Wang, S. M., Han, C., Lee, S. J., Patkar, A. A., Masand, P. S., & Pae, C. U. (2014). Schizophrenia relapse and the clinical usefulness of once-monthly aripiprazole depot injection. *Neuropsychiatric Disease and Treatment, 10*, 1605–1611. https://doi.org/10.2147/NDT.S52486

Wijnen, B., Smit, F., Uhernik, A. I., Ivstovanic, A., Dedovic, J., Dinolova, R., Nica, R., Velickovski, R., Wensing, M., Petrea, I., & Shields-Zeeman, L. (2020). Sustainability of community-based specialized mental health services in five European countries: Protocol for five randomized controlled trial-based health-economic evaluations embedded in the RECOVER-E Program. *JMIR Research Protocols, 9*(6), e17454. https://doi.org/10.2196/17454

Wolf, M. S., Serper, M., Opsasnick, L., O’Connor, R. M., Curtis, L., Benavente, J. Y., Wismer, G., Batio, S., Eifler, M., Zheng, P., Russell, A., Arvanitis, M., Ladner, D., Kwasny, M., Persell, S. D., Rowe, T., Linder, J. A., & Bailey, S. C. (2020). Awareness, attitudes, and actions related to COVID-19 among adults with chronic conditions at the onset of the U.S. outbreak: A cross-sectional survey. *Annals of Internal Medicine, 173*(2), 100–109. https://doi.org/10.7326/M20-1239

World Health Organization. (2020a, March). *WHO director-general’s opening remarks at the media briefing on COVID-19 – March 2020*. https://www.who.int/director-general/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19—11-march-2020

World Health Organization. (2020b). *The impact of COVID-19 on mental, neurological and substance use services: Results of a rapid assessment – October 2020*. https://www.who.int/publications/i/item/978924012455

Xiang, Y. T., Zhao, Y. J., Liu, Z. H., Li, X. H., Zhao, N., Cheung, T., & Ng, C. H. (2020). The COVID-19 outbreak and psychiatric hospitals in China: Managing challenges through mental health service reform. *International Journal of Biological Sciences, 16*(10), 1741–1744. https://doi.org/10.7150/ijbs.45072

Zhou, F., Yu, T., Du, R., Fan, G., Liu, Y., Liu, Z., Xiang, J., Wang, Y., Song, B., Gu, X., Guan, L., Wei, Y., Li, H., Wu, X., Xu, J., Tu, S., Zhang, Y., Chen, H., & Cao, B. (2020). Clinical course and risk factors for mortality of adult inpatients with COVID-19 in Wuhan, China: A retrospective cohort study. *Lancet (London, England), 395*(10229), 1054–1062. https://doi.org/10.1016/S0140-6736(20)30566-3

Zhou, J., Liu, L., Xue, P., Yang, X., & Tang, X. (2020). Mental health response to the COVID-19 outbreak in China. *The American Journal of Psychiatry, 177*(7), 574–575. https://doi.org/10.1176/appi.ajp.2020.20030304

Zimet, G. D., Dahlem, N. W., Zimet, S. G., & Farley, G. K. (1988). The multidimensional scale of perceived social support. *Journal of Personality Assessment, 52*, 30–41. https://doi.org/10.1207/s15327752jpa5201_2