

Psychotherapy Disruption Before and After the Transition to Virtual Mental Health Care Induced by the COVID-19 Pandemic

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Objective: This study aimed to examine population-level disruption in psychotherapy before and after the rapid shift to virtual mental health care induced by the onset of the COVID-19 pandemic in the United States.

Methods: This retrospective study used electronic health record and insurance claims data from three U.S. health systems. The sample included 110,089 patients with mental health conditions who were members of the health systems' affiliated health plans and attended at least two psychotherapy visits from June 14, 2019, through December 15, 2020. Data were subdivided into two 9-month periods (before vs. after COVID-19 onset, defined in this study as March 14, 2020). Psychotherapy visits were measured via health records and categorized as in person or virtual. Disruption was defined as a gap of >45 days between visits.

Results: Visits in the preonset period were almost exclusively in person (97%), whereas over half of visits in the

postonset period were virtual (52%). Approximately 35% of psychotherapy visits were followed by a disruption in the preonset period, compared with 18% in the postonset period. Disruption continued to be less common (adjusted OR=0.45) during the postonset period after adjustment for visit, mental health, and sociodemographic factors. The magnitude of the difference in disruption between periods was homogeneous across sociodemographic characteristics but heterogeneous across psychiatric diagnoses.

Conclusions: This study found fewer population-level disruptions in psychotherapy receipt after rapid transition to virtual mental health care following COVID-19 onset. These data support the continued availability of virtual psychotherapy.

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Access to mental health care continues to be a major public health issue in the United States and around the world. The problem of access to care has worsened in recent years because of multiple factors, including rising rates of mental health problems after the world first experienced the COVID-19 pandemic (1, 2). In addition, the health care workforce continues to shrink, especially in behavioral health, where there are staffing shortages, limited resources, and challenging workplace conditions (3). Barriers to behavioral health care access have also been compounded by problems with engagement in care, because individuals with mental health conditions often miss health care appointments (4). Lapses in treatment jeopardize overall improvement in mental health symptoms for care-seeking individuals; when symptoms worsen, these individuals often require more frequent, intensive, or long-term health care. These (preventable) extra services, coupled with

rescheduling of missed appointments, limit the availability of initial appointments for other patients trying to access

HIGHLIGHTS

- In a large U.S. sample across three health systems, patients with psychiatric diagnoses experienced fewer disruptions in psychotherapy receipt after the rapid transition to virtual care that accompanied the onset of the COVID-19 pandemic.
- For all types of psychiatric diagnoses studied and for all sociodemographic characteristics reported, individuals experienced fewer disruptions in psychotherapy in the 9 months after (vs. before) COVID-19 onset.
- The magnitude of difference in psychotherapy disruption between periods differed not by sociodemographic characteristic but by psychiatric diagnosis.

behavioral health care. Efforts to improve engagement in care are essential to improving access for more individuals and to promoting overall wellness among those receiving care (5, 6).

Virtual and digital care formats have been touted as potential solutions to improving health care access, engagement, and reach, including for those with myriad barriers to care, such as travel restrictions and stigma (7). Mental health care may be particularly well suited for virtual formats, given that physical examinations are usually not required as part of standard psychosocial assessments and that many treatments, such as talk-based psychotherapy, are delivered verbally (8). Prior to COVID-19 onset, several platforms were developed that provided the technical infrastructure to offer virtual mental health care. Many health systems began investing in this infrastructure for possible downstream use (9). However, many barriers to the use of these platforms were in place, given prior federal and other insurance regulations that restricted patient care across state lines and required physical evaluation during visits (10). Therefore, virtual mental health care was not a benefit covered by most insurance providers, which led to very limited clinical use.

The COVID-19 pandemic created a unique natural experiment. Many health systems were overwhelmed by COVID-19 care. They began implementing COVID-19 precautions by requiring the use of masks, limiting availability of in-person treatment options, and redirecting staff to support hospitals with large numbers of COVID-19–positive patients (11). Local communities simultaneously encouraged and often required social distancing and lockdowns (12). To support health care access, many regulations preventing coverage and use of virtual care were permanently or temporarily terminated. This development led to a rapid transition to widespread use of virtual care, particularly mental health care (13). For example, a 556% increase in daily administration of virtual mental health care occurred in the Veterans Health Administration after the onset of the pandemic (14). Also, in one large health system, virtual care increased from 10% of all mental health specialty visits in February 2020 to nearly 50% of all visits after March 2020 (15). During this immediate virtual health care rollout, calls of support (indicating that individuals may have equal or better access to and engagement in services with the removal of barriers to virtual care) and of widespread concern (indicating that some individuals with limited digital access or more complex conditions would be left behind) were heard (10, 16, 17). A recent study of two outpatient behavioral health clinics found an increase in total scheduled appointments, a 5% reduction in the rate of missed appointments, and a 26% increase in completed visits (13). Despite the rapid transition to virtual care in many places, less than half of all outpatient behavioral health providers offered any virtual mental health care after the onset of COVID-19 (18). Data are

needed at the population level to understand the impact of the transition to virtual mental health care on patient engagement to inform future policy and clinical implementation.

This study sought to fill this major gap in knowledge by investigating population-level engagement in psychotherapy of patients with mental health conditions 9 months before and 9 months after the rapid transition to virtual mental health care that accompanied the onset of the COVID-19 pandemic. This population-level retrospective study was conducted by using electronic health record data for all patients receiving psychotherapy across three large health care systems that serve five U.S. states with differing demographic characteristics.

METHODS

This study was conducted within the Mental Health Research Network (MHRN). The three health systems participating in this study were HealthPartners (Minnesota), Henry Ford Health (Michigan), and the Washington State region of Kaiser Permanente. Collectively, these systems serve over 3 million patients per year across five U.S. states. The institutional review boards at each participating system approved data use for this study.

This study included 110,089 unique patients who had a psychiatric diagnosis, attended at least two psychotherapy visits during the study period (before or after onset of the COVID-19 pandemic, defined as March 14, 2020), and were members of one of the participating health systems' affiliated health plans for at least 10 months per year in 2019 and 2020. A total of 555,620 visits were captured in the 9-month period before COVID-19 (starting June 14, 2019) and in the 9-month period after COVID-19 onset (ending December 15, 2020).

Data were captured from the MHRN virtual data warehouse (VDW) at each participating health system, which is used to facilitate data consistency and sharing across participating sites (19). The VDW is a federated data model that combines electronic health record and insurance claims data by using the same data definitions and variables across sites. It consists of data on patients' sociodemographic characteristics, diagnoses, procedures, visit types, and medications and of other administrative data recorded during clinical visits. Psychiatric diagnoses were defined by using standard *ICD-10* diagnosis codes (F01–F99) (20). These diagnoses were subdivided into the following types: attention-deficit hyperactivity disorder (ADHD), anxiety disorder, autism spectrum disorder, bipolar spectrum disorder, conduct or disruptive disorder, dementia, depressive disorder, personality disorder, schizophrenia spectrum disorder, other psychosis, and substance use disorder. These categories of mental health conditions were not mutually exclusive, so individuals could be represented in multiple categories. Patient demographic characteristics, including age, race-ethnicity, and gender, were recorded

during clinical visits. In addition, for each patient, census block data were used to create the geocoded variables of estimated income (“low income” was indicated when individuals resided in a census block where >20% of residents had an income below \$40,000 per year), estimated education (“low education” was indicated when the average education in a neighborhood was less than a 4-year college degree), and geographic location (urban or suburban vs. rural).

Psychotherapy visits were defined as any visit greater than or equal to 30 minutes with a specialty mental health provider and with any CPT procedure code of 90785–90862, indicating either initial psychotherapy evaluation or individual psychotherapy (21). Virtual care was identified by using CPT codes with a GQ modifier for asynchronous telehealth video visits or with a GT modifier for synchronous and interactive telehealth video visits, or was otherwise designated as a telehealth video or telephone visit via local health system records. Disruptions in receipt of psychotherapy were measured via a gap of >45 days between visits for each individual—a definition that has been used in prior research (22, 23).

Statistical analysis began with calculating descriptive statistics for the demographic characteristics and psychiatric diagnoses of patients in the sample. Unique psychotherapy visits were stratified by period (before and after onset of COVID-19) and summarized in terms of psychotherapy disruption (yes or no: whether a gap of >45 days occurred between visits) and encounter type (in person vs. virtual). Mean and median lengths of time between visits were computed overall and within periods. To assess whether disruption disproportionately affected specific subgroups of patients, adjusted logistic mixed-effects models were used to examine patient- and visit-level factors associated with the dichotomous outcome of psychotherapy disruption during the observation period (June 2019–December 2020). Model covariates included period (before and after onset of COVID-19), number of previous psychotherapy visits, demographic characteristics (age, race-ethnicity, gender, geographic location, estimated income, and estimated education), and psychiatric diagnoses. The correlation of repeated visits with prior visits by one individual was accounted for with a patient-specific random intercept. For logistic mixed-effects models, beta coefficients and standard errors were calculated, along with adjusted odds ratios, 95% confidence intervals, and p values. Finally, interaction terms were added to the models to examine how the association of period with psychotherapy disruption varied by sociodemographic characteristics and psychiatric diagnoses. Each interaction effect was tested in a separate model, where each interaction term was added to the base model with visit factors and demographic characteristics. The marginal effect of each demographic characteristic and psychiatric diagnosis was estimated by using partial derivatives from the interaction terms to describe the effect of COVID-19 on the length between visits.

Statistical significance was defined as $p < 0.05$. Analyses were conducted with SAS, version 9.4.

RESULTS

The overall population sample included 110,089 unique individuals with at least one psychiatric diagnosis who made 555,620 psychotherapy visits at three health systems during the study period (9 months before and 9 months after COVID-19 onset). More total visits occurred during the preonset period ($N = 284,826$) compared with the postonset period ($N = 270,794$). The mean age of the sample was 46.6 years (median = 46 years). The sample was 68.9% female, and 67.9% of patients identified as White. Nearly 8% of the sample lived in rural areas. Approximately 5% of the sample lived in neighborhoods with an estimated per-resident annual income of less than \$40,000 per year, and 25.5% lived in neighborhoods whose residents had an estimated average education lower than a 4-year college degree. The most frequently diagnosed mental health conditions within the sample were anxiety (72.7%) and depressive (65.3%) disorders. Conduct or disruptive disorders were least common in the sample (0.6%) (Table 1).

As shown in Table 2, among the total number of visits occurring during the 18-month observation period, most occurred before the onset of COVID-19. Approximately one-third (35.4%) of all psychotherapy visits in the initial 9-month period were followed by a disruption in psychotherapy receipt of >45 days, whereas only 17.9% of all visits in the 9-month period after COVID-19 onset were followed by such a disruption. Only 3.1% of all visits recorded during the preonset period were virtual visits, whereas 51.8% of visits were virtual in the postonset period. Furthermore, the median time between visits in the preonset period was 27 days, whereas in the postonset period it was 14 days. The differences in the composition of virtual visits and length between visits were both statistically significant ($p < 0.001$).

During the entire observation period (Table 3), male patients and those identifying as Asian, Hispanic, or another race or ethnicity were less likely to have a disruption between psychotherapy visits. Older individuals and those living in rural areas were more likely to have a disruption. Individuals with depressive, anxiety, or bipolar disorders were less likely to have a disruption, whereas those with schizophrenia, ADHD, autism, conduct or disruptive disorders, dementia, or personality disorders were more likely to have a disruption. After adjustment for visit, demographic, and mental health factors, individuals were less likely to have disruptions in psychotherapy receipt after (vs. before) the onset of COVID-19 and the widespread switch to virtual care (adjusted OR = 0.45).

Because the sociodemographic main effects were statistically significant, we then added interaction terms to assess for the interaction of each sociodemographic factor with each period. Although the estimates of the interaction terms were not significant at the level of $\alpha = 0.05$, the marginal effects of period on every assessed categorical sociodemographic group

were calculated (adjusted OR=0.64–0.70) (Table 4). In addition, the interaction between each psychiatric diagnosis and each period was assessed separately. Varying magnitudes of disruption were observed across different mental health conditions when comparing the periods before and after the onset of the COVID-19 pandemic. Patients with any mental health condition were less likely to have disruptions in psychotherapy receipt after COVID-19 onset and the accompanying rapid shift to virtual care, compared with before COVID-19 onset (Figure 1 and the online supplement to this article).

DISCUSSION

This study represents the largest population-level examination of psychotherapy treatment disruption in the United States and compared disruptions during the 9 months before the onset of COVID-19 with those occurring after COVID-19 onset, when a rapid shift from nearly all in-person visits to mostly virtual visits was observed. Consistent with other large U.S. health systems, the health systems participating in this study demonstrated sizable and rapid shifts from in-person to virtual mental health care immediately after the onset of the COVID-19 pandemic (24). Overall, in this study, the rapid transition to virtual care resulted in better continuity of psychotherapy visit attendance, as defined by fewer disruptions in care of >45 days. In addition, individuals had significantly fewer days between appointments during the postonset period. Thus, in this large population sample, individuals were more likely to return for additional psychotherapy visits after the widespread shift to virtual care. These population-level findings are consistent with other recent studies with smaller samples that showed better adherence to virtual mental health care compared with in-person visits (13, 25). In the present study, about 48% of psychotherapy visits during the postonset period were still conducted in person, which reflects variation in the degree to which these systems shifted to virtual care in response to local COVID-19 severity. Despite this finding, it is possible that improved engagement in psychotherapy during this period was reflective of a greater need for mental health services during COVID-19 rather than of the shift to virtual care. Future research should examine this relationship further.

The overall findings in this study support prior research showing that older individuals and those living in rural areas may experience more disruption in mental health care (26, 27). Contrary to prior research (28, 29), however, this study did not find disparities in psychotherapy adherence among patients belonging to historically minoritized racial-ethnic groups. Whereas most other studies have focused on access to all psychotherapy visits, the present study focused on disruptions in care after an initial visit. Prior research demonstrates that initial access may be the biggest barrier to receipt of psychotherapy (23, 30).

TABLE 1. Sociodemographic characteristics and psychiatric diagnoses at baseline among individuals ≥18 years old, 2019–2020 (N=110,089)^a

Sociodemographic characteristic	N	%
Gender		
Female	75,797	68.9
Male	34,292	31.1
Race-ethnicity		
White	74,765	67.9
Black	5,909	5.4
Hispanic	3,671	3.3
Asian	3,197	2.9
Other	2,353	2.1
Unknown	20,194	18.3
Low education ^b		
No	80,465	73.1
Yes	28,014	25.5
Unknown	1,610	1.5
Low income ^c		
No	103,097	93.6
Yes	5,362	4.9
Unknown	1,630	1.5
Rural location		
No	89,463	81.3
Yes	8,595	7.8
Unknown	12,031	10.9
Mental health condition ^d		
ADHD	11,345	10.3
Anxiety disorder	80,042	72.7
Autism spectrum disorder	1,224	1.1
Bipolar spectrum disorder	7,226	6.6
Conduct/disruptive disorder	678	.6
Dementia	4,791	4.4
Depressive disorder	71,855	65.3
Personality disorder	3,688	3.4
Other psychosis	1,760	1.6
Schizophrenia spectrum disorder	1,769	1.6
Substance use disorder	17,141	15.6

^a The mean age of the sample was 46.6±17.3 years.

^b Living in a neighborhood where the average resident's education level was less than a 4-year college degree.

^c Living in a census block where >20% of residents had an income below \$40,000 per year.

^d Participants could have more than one condition.

Despite concerns that there may be inequities in use of and access to virtual mental health care among certain groups of individuals (31, 32), we did not find sociodemographic subgroup differences in psychotherapy disruption after more widespread availability of virtual care. In addition, individuals with any of the mental health conditions included in this study were less likely to have disruptions in psychotherapy after the proliferation of virtual care. This finding is consistent with prior studies demonstrating that virtual care may be particularly beneficial in supporting ongoing care with providers (33). Psychotherapy may be particularly well suited for virtual care. Despite the narrowed gap in psychotherapy engagement through the shift to virtual care, there remain significant gaps in access to mental health services among those with psychiatric diagnoses. More research is also needed to better understand access to and use of other

TABLE 2. Characteristics of psychotherapy visits during the 9 months before and the 9 months after the declaration of COVID-19 as a national public health emergency, 2019–2020^a

Variable	Total visits (N=555,620)		Visits in the 9 months before COVID-19 onset (N=284,826)		Visits in the 9 months after COVID-19 onset (N=270,794)	
	N	%	N	%	N	%
Psychotherapy disruption (gap of >45 days)						
No	406,508	73.2	184,066	64.6	222,442	82.1
Yes	149,112	26.8	100,760	35.4	48,352	17.9
Encounter type						
In person	406,447	73.2	275,880	96.9	130,567	48.2
Virtual	149,173	26.8	8,946	3.1	140,227	51.8
Length between visits (days)						
Mean±SD	48.9±73.2		67.1±91.8		29.8±37.5	
Median	20.0 ^b		27.0 ^c		14.0 ^d	

^a Analyses comparing the period of 9 months before COVID-19 onset (June 14, 2019–March 14, 2020) with the period of 9 months after COVID-19 onset (March 15, 2020–December 15, 2020) were statistically significant at p<0.001.

^b Interquartile range 9.0–50.0.

^c Interquartile range 13.0–82.0.

^d Interquartile range 7.0–33.0.

types of virtual mental health care, such as virtual medication management visits with psychiatrists and use of integrated care models in non-behavioral health settings.

TABLE 3. Likelihood of having a disruption in psychotherapy receipt of >45 days, 2019–2020 (N=110,089)^a

Variable	AOR	95% CI	p
Visit level			
Time of psychotherapy visit: after COVID-19 onset (reference: before COVID-19)	.45	.44–.46	<.001
N of previous psychotherapy visits (1 unit per SD)	.50	.49–.51	<.001
Individual level			
Sociodemographic factors			
Age	1.13	1.12–1.14	<.001
Male (reference: female)	.91	.89–.94	<.001
Race-ethnicity (reference: White)			
Asian	.59	.55–.64	<.001
Black	1.02	.97–1.08	.462
Hispanic	.72	.67–.77	<.001
Other	.76	.70–.82	<.001
Low education (reference: no)	1.01	.98–1.04	.668
Low income (reference: no)	.94	.89–1.00	.033
Rural location (reference: no)	1.81	1.72–1.89	<.001
Mental health condition ^b			
ADHD	1.28	1.23–1.33	<.001
Anxiety disorder	.90	.87–.92	<.001
Autism spectrum disorder	1.42	1.27–1.58	<.001
Bipolar spectrum disorder	.81	.77–.85	<.001
Conduct/disruptive disorder	1.30	1.13–1.51	.004
Dementia	1.19	1.12–1.26	<.001
Depressive disorder	.71	.69–.73	<.001
Personality disorder	1.07	1.01–1.14	.031
Other psychosis	.97	.88–1.07	.509
Schizophrenia spectrum disorder	1.19	1.09–1.31	.003
Substance use disorder	1.03	1.00–1.07	.069

^a The adjusted odds ratios (AORs) represent the entire study period of June 14, 2019, through December 15, 2020, with adjustment for visit factors and patients' sociodemographic characteristics.

^b The reference was the absence of a given condition.

Moving forward, virtual mental health care appears likely to continue and to represent a large portion of all psychotherapy services provided. Virtual care may have many benefits compared with in-person care, including greater ease of access, fewer barriers related to transportation, less need to take off time from work, and less stigma. Individuals in rural areas may benefit substantially from ongoing use of virtual care. In addition, therapists may have the ability to better observe living environments. Nonetheless, successful virtual mental health care relies on

TABLE 4. Marginal effects of psychotherapy disruption estimated from multilevel models, with cross-level interactions for each sociodemographic factor and period^a

Sociodemographic characteristic	AOR	95% CI
Age (years)	.998	.997–.999
Gender		
Female	.67	.67–.68
Male	.67	.66–.69
Race-ethnicity		
White	.67	.66–.68
Black	.64	.62–.67
Hispanic	.69	.66–.72
Asian	.70	.66–.73
Other	.68	.64–.72
Low education		
No	.68	.67–.69
Yes	.67	.65–.68
Low income		
No	.68	.67–.68
Yes	.68	.65–.71
Rural location		
No	.68	.68–.69
Yes	.66	.64–.68

^a The adjusted odds ratios (AORs) represent the effect of the 9 months after COVID-19 onset (vs. the 9 months before COVID-19 onset), with adjustment for the number of previous psychotherapy visits and patients' sociodemographic characteristics. All AORs were significant at p<0.001.

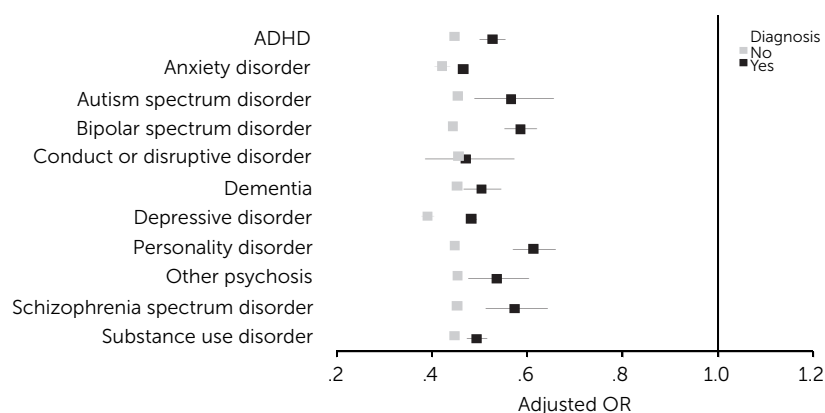
strong, reliable Internet connections as well as good and up-to-date computer equipment. Furthermore, privacy concerns about virtual care remain. More research is also needed on therapist-patient communication and rapport as well as on the ability of therapists to assess nonverbal cues, such as affect and facial and body expressions, during virtual sessions. Finally, it is important to evaluate patient preferences when determining whether virtual or in-person psychotherapy is most appropriate (34–36).

This study must be evaluated in the context of its limitations. We did not evaluate use of a patient's first psychotherapy visit, so the findings may not represent initial use of services. Differences in access to psychotherapy should be examined in future research on specific populations. Similarly, this study was not able to examine reasons for disengagement from care. This study was conducted in three large health systems that possessed virtual mental health care infrastructure. Some systems may not have developed the infrastructure to provide these services. This study did not examine use of virtual care for medication management or for types of care other than psychotherapy, which may present different challenges. In addition, some patients in this study had missing data, including on race-ethnicity, which may have affected the results. We also were not able to differentiate between various modalities of psychotherapy that were delivered. Severity of illness and motivation to seek care were not assessed in this study. Even though differences in psychotherapy disruption were observed, this study did not assess whether differences in disease outcomes were present. The possibility remains that differences in population-level severity of illness before versus after the onset of COVID-19 may have affected the results. Similarly, patients seeking care in the postonset period may have perceived greater need for services, had more flexible schedules, or been more motivated to attend visits compared with individuals receiving care prior to the pandemic. Finally, this study was unable to assess the reason for the difference in total visits before versus after the onset of the pandemic. This difference may be due to unmeasured variance among the populations seeking care during both periods or to limitations in appointment availability—either throughout the postonset period or during the immediate weeks after the onset of the pandemic, when these systems were transitioning to virtual care.

CONCLUSIONS

In a sample of >110,000 individuals with mental health conditions, the population of patients experienced fewer disruptions in psychotherapy receipt after the onset of the COVID-19 pandemic and the rapid shift to virtual care.

FIGURE 1. Marginal effects of psychotherapy disruption before versus after COVID-19 onset^a



^a Results were derived from multilevel models, with cross-level interactions for each psychiatric diagnosis with each period. Odds ratios (ORs) were adjusted for number of previous psychotherapy visits and patients' sociodemographic characteristics. Lower adjusted ORs indicate less disruption of psychotherapy receipt during COVID-19. Error bars indicate 95% confidence intervals.

These findings support continued use of virtual psychotherapy as an option for care when appropriate infrastructure is in place. In addition, these findings support the continuation of policies that provide access to and coverage for virtual psychotherapy.

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