Editor's Choice

Adaptations to Opioid Use Disorder Care During the COVID-19 Pandemic: A National Survey of Prescribers

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Objectives: Among opioid use disorder (OUD)-treating providers, to characterize adaptations used to provide medications for OUD (MOUD) and factors associated with desire to continue virtual visits post-COVID-19 pandemic.

Methods: In a national electronic survey of OUD-treating prescribers (July-August 2020), analyses restricted to X-waivered buprenorphine prescribers providing outpatient, longitudinal care for adults with OUD, quantitative and qualitative analyses of survey items and free text responses were conducted.

Results: Among 797 respondents, 49% were men, 57% ≥50 years, 76% White, 68% physicians. Respondents widely used virtual visits to continue prescribing existing MOUD regimens (79%), provide behavioral healthcare (71%), and initiate new MOUD prescriptions (49%). Most prescribers preferred to continue/expand use of virtual visits after COVID-19. In multivariable models, factors associated with preference to continue/expand virtual visits to initiate MOUD postpandemic were treating a moderate number of patients prepandemic (aOR = 1.67; 95%[CI] = 1.06,2.62) and practicing in an urban setting (aOR = 2.17; 95%[CI] = 1.48,3.18). Prescribing buprenorphine prepandemic (aOR = 2.06; 95%[CI] = 1.11,3.82) and working in an academic medical center (aOR = 2.47; 95%[CI] = 1.30,4.68) were associated with preference to continue/expand use of virtual visits to continue MOUD postpandemic. Prescribing naltrexone extended-release injection prepandemic was associated with preference to continue/expand virtual visits to initiate and continue MOUD (aOR = 1.51; 95%[CI] = 1.10,2.07; aOR = 1.74; 95%[CI] = 1.19,2.54). Qualitative findings suggest that providers appreciated virtual visits due to convenience and patient accessibility, but were concerned about liability and technological barriers.

Conclusions: Surveyed prescribers widely used virtual visits to provide MOUD with overall positive experiences. Future studies should evaluate the impact of virtual visits on MOUD access and retention and clinical outcomes.

Key Words: COVID-19, medications to treat opioid use disorder (MOUD), opioid use disorder (OUD), prescriber virtual visit, survey

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Two public health emergencies, the worsening opioid overdose epidemic and the coronavirus disease 2019 (COVID-19) pandemic are occurring concurrently.[1,2] To facilitate access to and retention on medications for opioid use disorder (MOUD) while minimizing in-person encounters during the pandemic many temporary federal policy changes were made including facilitating virtual visits and expanding compensation for telephone/video encounters.[3,4] MOUD available in the US are various formulations of buprenorphine, methadone, and naltrexone.

Rapid changes to provide MOUD were designed to decrease structural barriers to OUD care during the pandemic, but it is unclear which changes prescribers used and would like to continue postpandemic.[5–7] We sought to: (1) identify clinical adaptations implemented to deliver MOUD during the pandemic; (2) examine prescribers' preference for practice of adaptations postpandemic; (3) explore factors associated with prescribers' most commonly preferred postpandemic adaptations and provide context for these preferences by conducting a US-based national survey of buprenorphine prescribers with multiple-choice and free-text questions. Virtual visits were defined as direct visits between patients and providers conducted via phone or video for OUD care, including MOUD prescriptions and behavioral healthcare. We hypothesized that prescribers would commonly report use of virtual visits to initiate new MOUD prescriptions and continue prescribing existing

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MOUD regimens and that prescribers would favor continued practice of virtual visits to provide MOUD post-pandemic.

METHODS

The multiorganizational collaboration was spearheaded by the American Academy of Addiction Psychiatry (AAAP) including academic partners at Columbia University, which expanded to subsequently include partnering with other organizations (American Medical Association [AMA], Association for Multidisciplinary Education and Research in Substance Use and Addiction, American Osteopathic Academy of Addiction Medicine, American Psychiatric Association [APA], American Society of Addiction Medicine [ASAM], Boston University, University of Missouri-Kansas City [UKMC], and Yale University) over a common interest to understand the policy implications for clinical adaptations adopted to provide OUD care during COVID-19. The collaboration began with an introductory call organized by AAAP and included organizational representatives. AAAP provided ongoing administrative support. The study was reviewed by the institutional review board at Yale and deemed exempt. Participants read and acknowledged a statement describing the survey's risks and benefits and their rights as study participants before initiating the survey.

Population

We conducted the *OUD Provider COVID-19 Survey* (Appendix, http://links.lww.com/JAM/A317), an anonymous online survey of subscribers of listservs managed by our collaborators and encouraged forwarding the survey to other listservs to maximize distribution.[8] At the time of the survey, AAAP had 50,000 listserv subscribers, AMA 80,000, ASAM 6300, and Addiction Technology Transfer Center Network 20,695.[8] Distribution lists included prescriber and nonprescribers and membership was not mutually exclusive. To survey only X-waivered prescribers who were certified by the Drug Enforcement Administration to prescribe buprenorphine to treat OUD, people who indicated they were not X-waivered in response to the first survey question were not presented with additional questions. We were unable to determine the percentage of listserv members who were X-waivered prescribers. The survey was conducted from July 14-August 15, 2020, using Qualtrics.

Survey Items

The survey was created after literature review, comparison to related surveys, and input from 17 multidisciplinary experts of clinicians, policy experts, and educators.[3,4,9] It was reviewed twice, revised thrice, and iteratively refined after piloting with team members before distribution.

Demographics

The survey inquired about personal/professional characteristics and clinical practices. For respondents who did not select any options for "Which MOUD did you prescribe/order before the COVID-19 pandemic to treat OUD?" we recorded each medication as not endorsed. The MOUD listed in the survey were methadone, buprenorphine-naloxone or buprenorphine mono product, buprenorphine extended-release injection, buprenorphine implants, and naltrexone extended-release injection (Appendix, http://links.lww.com/JAM/A317).

COVID-19 Related Clinical Challenges/Practices

Questions asked about challenges in providing MOUD, clinical practices used before COVID-19, federal policy changes implemented during COVID-19, and changes participants would like to continue/expand postpandemic. Free text questions inquired about positive/negative experiences in clinical practices during COVID-19, and which future policy changes/innovations to expand/improve after the pandemic.

COVID-19 Clinical Adaptations

Participants were asked whether they used any of 16 clinical adaptations during COVID-19, allowing for multiple answers. Response options included virtual visits to initiate new MOUD prescriptions, to continue prescribing existing MOUD regimens, or to provide behavioral healthcare/ counseling. Regardless of response about use of clinical adaptations, prescribers were also asked about preference to continue/expand each listed adaptation postpandemic. Two questions, "During the pandemic, which practices have you continued or started to provide MOUD?" and "Which of these innovations would you like to see continued or expanded after the pandemic?" had response options of "no changes" in addition to a list of possible changes. No response to any option was interpreted as missing. Participants were asked "As a provider, which pandemic-related clinical practice changes are you satisfied with?"

To gain a richer understanding of the quantitative data, we analyzed free text responses to optional open-ended questions: "What positive experiences have you had in your clinical practice during the pandemic (as a result from policy changes) that you would like to share? What lessons have you learned that you would like to share with others?" and "What negative experiences have you had with the pandemic-related policy changes to your clinical practice that you would like to share?"

Statistical Analysis

We applied an explanatory mixed-methods design where we first analyzed quantitative data to answer our primary research questions and subsequently analyzed qualitative data to contextualize quantitative findings, giving priority to quantitative data.[10] We converted multiple-response questions to sets of dichotomous indicators scaled as 1 = endorsed, 0 = not endorsed for each response option and calculated the proportion of respondents endorsing each one. To categorize participants' professions, we combined physician assistant/associate and advance-practice nurses into one advanced practice provider (APP) category. Survey item response options that were conceptually similar were combined. The composite variables, coded 1 if any component response was endorsed or 0 if none were endorsed, were entered in logistic regression models. This method was used to address restricted variability for some response options and to reduce the number of variables for model parsimony. Using all available data, we then used a series of simple logistic regression models to illustrate unconditional associations of select survey variables with two dichotomous outcomes: preference to continue/expand virtual visits to (a) initiate

MOUD and (b) continue MOUD. We centered our model around these 2 outcomes as they were closely related adaptations that many participants were satisfied with and continuing/expanding their use postpandemic was actionable. Variables selected for these exploratory bivariate regression models were prescriber and clinic characteristics, COVID-19 practice adaptations, and prescriber satisfaction with adaptations. The association of each item with outcomes was evaluated for statistical significance using 2-sided alpha = 0.05.

To understand the combined effect of prescriber and clinic characteristics on outcomes, variables that were statistically significant in simple models for either outcome that measured prescriber/practice characteristics were entered simultaneously into multivariable logistic regression models of those outcomes using forced entry. The multivariable models were restricted to prescribers in rural, suburban, or urban settings (excluding n = 21 reporting "other" settings), with rural setting as the reference category. Respondents were listwise deleted if they were missing data for any predictor, resulting in deletion of one respondent. In sensitivity analyses, we re-ran bivariate and multivariable logistic regression models excluding prescribers working in opioid treatment programs (OTPs). Data were analyzed using SAS, 9.4.

Qualitative Analysis

Following established methods, we used qualitative inductive thematic analysis to analyze free text data,[11,12] allowing for themes to be identified not previously considered.[13] Using established practices, 2 researchers familiarized themselves with the raw free-text responses.[13–15] Quotes related to policy changes were identified and retained. Quotes unrelated to policy changes were excluded from analysis, which were generally "lessons learned" regarding OUD care during COVID-19. Overlapping codes related to policy changes were retained in analysis. Next, researchers generated initial themes based on emergent codes from the initial reading. During a second reading of the data, themes were mapped to codes and then reviewed, condensed, and defined. Thematic saturation was determined when no new codes emerged upon reviewing the data. Saturation did not inform sampling as the entire dataset was used in coding.[16]

RESULTS

Participant and Practice Characteristics

Among invited participants, 1900 initiated and completed the survey. We excluded respondents who were not practicing X-waivered prescribers in the US (n = 790), X-waivered MOUD prescribers who did not answer any questions after the initial screening question or who were missing data on the question containing the two outcomes of regression analyses (n = 223), and those not providing care to adults in longitudinal outpatient settings (n = 90). In total, 797 participants were included in the final sample (Table 1).

Challenges Providing MOUD During COVID-19

Fifty-six percent of respondents reported patients having barriers to using telephones or lacking comfort with technology, 49% patients having housing instability, and 25% clinics having limited virtual visit capabilities. Fifty-seven percent of prescribers reported putting on hold or markedly reducing the number of urine toxicology screens performed.

COVID-19 Clinical Adaptations

The most common adaptation used were virtual visits to continue MOUD in established patients with OUD (79%), provide behavioral healthcare (71%), and initiate MOUD (49%). 44% reported providing "longer"-duration or "more" refills of MOUD (terms not otherwise defined by the survey item, and thus relative to each prescriber's own typical practice). Prescribers reported use of online mutual help groups (39%) and using expanded reimbursement for virtual visit services (37%) (Table 2, Supplemental Figure 1, http://links.lww.com/JAM/A317). Seven percent of prescribers allowed patients to mail urine samples for toxicology screening. When surveyed about which clinical adaptations they favored continuing/expanding postpandemic, participants most often selected virtual visits to continue MOUD (78%), provide behavioral healthcare (72%), initiate MOUD (55%), and expand virtual visit reimbursements (57%) (Table 2, Supplemental Figure 2, http://links.lww.com/JAM/A317).

Prescriber Satisfaction With Clinical Adaptations

Most prescribers reported satisfaction with the adaptation of virtual visits to maintain MOUD (70%) and provide behavioral healthcare (56%). A smaller subset reported satisfaction with adaptation of virtual visits to initiate MOUD (36%) and with other adaptations including expanded reimbursement for virtual visits (33%), use of online mutual help groups (28%) and provision of longer-duration or more refills of MOUD (23%). Less than 20% of our sample expressed satisfaction with the remaining adaptations.

Factors Associated With Preference to Continue Virtual Visits to Provide MOUD Postpandemic

In a series of simple (unconditional) logistic regression models the following factors were associated with preference to continue/expand virtual visits to initiate MOUD prescription postpandemic: specializing in psychiatry, years treating patients with MOUD, and working in an urban setting (Table 3). Working in a rural setting and private practice were negatively associated with that outcome. Working with patients with primarily public insurance was associated with greater desire to use virtual visits to continue MOUD postpandemic, whereas working in an OTP was negatively associated with that outcome. Factors associated with preference to continue/expand virtual visits to initiate and continue MOUD prescription postpandemic were: (1) having prescribed buprenorphine-naloxone, buprenorphine monotherapy, or injectable naltrexone prepandemic, (2) working in an academic medical center or federally qualified health center (FQHC), (3) facing pandemic-related challenges to MOUD provision, (4) having utilized any of several adaptations to provide MOUD during the pandemic, and (5) being satisfied with highly-endorsed adaptations. Other examined factors were

TABLE 1. Individual and Clinical Practice Characteristics Among X-waived Prescribers, n = 797

	Overall (%)
Sex	
Men	49
Women	43
Missing/Other	8
Age (Years)	
< 50	37
≥ 50	37
Missing	6
Race & ethnicity[a]	
White	6
Asian	5
Hispanic, Latino or Spanish origin	5
Black or African American	3
Other	4
Missing/Opted no answer	11
Clinical profession[a]	
Family medicine	31
Advanced Practice Provider (APP)	21
Psychiatry	21
Internal medicine	14
Obstetrics/gynecology	3
Other	21
Board certified in addiction	40
Years prescribing MOUD	
0–5	50
6–10	18
11–15	14
≥15	19
Type of MOUD prescribed before COVID-19[a]	
Buprenorphine-naloxone or buprenorphine monotherapy	93
Injectable or implantable buprenorphine (composite)	28
Injectable buprenorphine[b]	28
Implantable buprenorphine[b]	4
Methadone	21
Injectable naltrexone	53
Number of patients prescribed MOUD per month	
<25	39
26–50	20
51–100	16
≥100	25
Missing	<1
Primary clinical practice setting[a]	
Primary care	20
Private practice	2
Federally Qualified Health Center (FQHC)	14
Opioid treatment program	21
Academic medical center	15
Specialty clinic[c]	15
Emergency setting[d]	1
Government setting (composite)	8
Veterans Health Administration (VHA)[e]	4
Prison/jail[e]	3
Indian Health Service (IHS)[e]	1
Urbanicity of clinical practice	
Urban	46
Suburban	2
Rural	24
Other	3
Main health insurance of patients	
Public insurance (composite)	66
Medicaid[f]	57
Medicare[f]	4
VHA[f]	3
IHS[f]	1
Private insurance	16
Self-pay	11
Uninsured	4
Missing	<1

TABLE 2. Challenges During Pandemic and Opinions About Clinical Practice Adaptations Among X-waivered Prescribers, n 797

Challenges to Providing MOUD During Pandemic[a]	
Patient-related challenges (composite)	74
Patients with barriers to using telephone or technology[g]	56
Patients with unstable housing[g]	49
Changes in local drug supply[g]	13
Patients lost to follow-up	46
Infrastructure limitations (composite)	64
Difficulty obtaining urine toxicology screens[h]	49
Clinics with limited virtual visit capabilities[h]	25
Reduced clinical funding[h]	21
Staff shortage (composite)	29
Shortage of non-prescriber clinical staff[i]	21
Shortage of prescribers of MOUD[i]	15
Missing	<1
Adaptations used during COVID-19[a]	
Use of virtual visits, technology, online resources (composite)	8
Virtual visits to maintain MOUD[j]	9
Virtual visits to provide behavioral health[j]	1
Virtual visits to initiate MOUD[j]	49
Online help groups[j]	39
Expanded virtual visit reimbursement[j]	3
Phone applications for counseling[j]	19
Websites for counseling[j]	18
Video observed medication administration[j]	5
Expanded access to MOUD (composite)	48
Longer durations/more refills of MOUD[k]	44
Expanded access to take-home methadone[k]	14
Expanded naloxone prescription	16
Street teams, mobile services, patient surrogates (composite)	1
Partnering with a patient surrogate[l]	14
Mobile services to assess patients[l]	5
Mail services for urine toxicology screens and medication delivery (composite)	16
Medications mailed to patients[m]	10
Urine toxicology surveillance via mail[m]	7
No changes	8
Expanded use of injectable MOUD	7
Other	6
Missing	<1
Prescriber Satisfaction with Adaptations	
Virtual visits to maintain MOUD	0
Virtual visits to provide behavioral health	56
Virtual visits to initiate MOUD	36
Expanded virtual visit reimbursement	33
Online help groups	28
Longer durations/more refills of MOUD	23
Prescriber Preference to Continue Adaptations	
Virtual visits to maintain MOUD	8
Virtual visits to provide behavioral health	2
Virtual visits to initiate MOUD	55
Expanded virtual visit reimbursement	5
Online help groups	49
Longer durations/more refills of MOUD	32

[a]Percentages add to >100% due to the option for multiple responses.
[b]Combined into "Injectable or implantable buprenorphine" for logistic regression modeling.
[c]Specialty clinic consisted mainly of addiction medicine/psychiatry clinics.
[d]Respondents endorsing emergency setting also endorsed another setting.
[e]Combined into "Government setting" for logistic regression modeling.
[f]Combined into "Public insurance" for logistic regression modeling.
[g]Combined into "Patient-related challenges" for logistic regression modeling.
[h]Combined into "Infrastructure limitations" for logistic regression modeling.
[i]Combined into "Staff shortage" for logistic regression modeling.
[j]Combined into "Use of virtual visits, technology, online resources" for logistic regression modeling.
[k]Combined into "Expanded access to MOUD" for logistic regression modeling.
[l]Combined into "Street teams, mobile services, patient surrogates" for logistic regression modeling.
[m]Combined into "Mail services for urine toxicology screens and medication delivery" for logistic regression modeling.

TABLE 3. Simple and Multivariable Logistic Regression of Preference to Continue/expand Virtual Visits Postpandemic to Initiate or Continue MOUD

		Simple Logistic Regression					
		Virtual Visits to Initiate MOUD			Virtual Visits to Continue MOUD		
Covariates	N	Unadjusted Odds Ratio	95% Wald Confidence Limits		Unadjusted Odds Ratio	95% Wald Confidence Limits	
Years prescribing MOUD (reference category 0–5)							
6–10	797	1.63*	1.09	2.43	1.32	0.81	2.14
11–15		0.77	0.51	1.1	1.54	0.88	2.68
More than 15		0.81	0.56	1.19	0.80	0.52	1.20
Number of patients prescribed MOUD per month (reference category <25)							
26–50	796	1.93*	1.30	2.8	2.01*	1.22	3.31
51–100		1.09	0. 2	1.65	1.40	0.85	2.30
More than 100		1.23	0.86	1. 6	1.3	0.89	2.09
Clinical Profession							
Psychiatry (reference = all other professions)	797	1.52*	1.0	2.1	0.96	0.63	1.44
Family Medicine (reference = all other professions)	797	0.93	0.69	1.26	1.08	0. 5	1.55
Advanced Practice Provider (APP) (reference = all other professions)	797	1.01	0. 2	1.42	0.86	0.58	1.29
IM Physician (reference = all other professions)	797	0.93	0.62	1.39	0.98	0.60	1.60
OB/GYN (reference = all other professions)	797	1.22	0.49	3.01	1.61	0.4	5.55
Type of MOUD prescribed before COVID-19							
Buprenorphine-naloxone or buprenorphine monotherapy (reference = not prescribed)	797	1.76*	1.03	3.00	2.88*	1.6	4.98
Injectable or implantable buprenorphine[a] (reference = not prescribed)	797	1.20	0.88	1.64	1.34	0.91	1.9
Methadone (reference = not prescribed)	797	0.86	0.61	1.22	0.81	0.54	1.20
Injectable naltrexone (reference = not prescribed)	797	1.84*	1.39	2.45	2.06*	1.46	2.90
Urbanicity of clinical practice							
Rural (reference = all other settings)	797	0.45*	0.33	0.63	0. 3	0.50	1.0
Suburban (reference = all other settings)	797	1.09	0.80	1.50	0.94	0.65	1.3
Urban (reference = all other settings)	797	1.57*	1.19	2.09	1.31	0.93	1.85
Main health insurance of patients							
Public insurance (Medicaid, Medicare, VA, IHS)[b] (reference = not receiving this insurance)	796	1.33	0.99	1. 9	1.56*	1.11	2.20
Private insurance (reference = not receiving this insurance)	796	0.77	0.53	1.13	0.88	0.56	1.3
Self-pay (reference = not receiving this not use)	796	0.80	0.52	1.26	0.5	0.45	1.25
Uninsured (reference = not uninsured)	796	0.92	0.44	1.91	0.4	0.22	1.00
Adaptations used during COVID-19							
Use of virtual visits, technology, online resources[c] (reference = did not use)	795	3.30*	2.09	5.19	5.21*	3.35	8.08
Mail services for urine toxicology screens and medication delivery[d] (reference = did not use)	795	1.89*	1.26	2.83	2.10*	1.21	3.66
Street teams, mobile services, patient surrogates[e] (reference = did not use)	795	2.39*	1.60	3.58	2.57*	1.46	4.52
Expanded access to MOUD[f] (reference = did not use)	795	1.93*	1.46	2.5	2.42*	1.0	3.46
Expanded use of injectable /implantable buprenorphine or injectable naltrexone (reference = did not use)	795	2.94*	1.52	5.68	2.83*	1.11	7.22
Expanded naloxone provision (reference = did not use)	795	2.69*	1.6	4.11	2.01*	1.1	3.45
Primary Clinical Practice Setting							
Government setting[g] (reference = all other settings)	797	1.15	0.69	1.92	1.60	0.80	3.21
Private practice (reference = all other settings)	797	0.72	0.52	0.98	0.84	0.58	1.22
Academic medical center (reference = all other settings)	797	1.66*	1.11	2.48	2.42*	1.35	4.33
Opioid treatment program (reference = all other settings)	797	0.79	0.56	1.11	0.66	0.44	0.9
Primary care (reference = all other settings)	797	1.03	0.73	1.46	1.02	0.67	1.55
Specialty clinic (reference = all other settings)	797	1.41	0.94	2.11	1.04	0.65	1.68
Emergency setting (reference = all other settings)	797	1.01	0.27	3.79	0.35	0.09	1.30
Federally qualified health center (reference = all other settings)	797	1.64*	1.08	2.48	1.84*	1.05	3.21
Addiction treatment (reference = all other settings)	797	1.42	0.41	4.89	1.27	0.27	5.93
Mental health clinic (reference = all other settings)	797	1.13	0.36	3.60	0.84	0.23	3.14
Challenges to Providing MOUD During Pandemic							
Staff shortage[h] (reference = challenge not experienced)	791	1.39*	1.02	1.90	1.35	0.92	1.98

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TABLE 3. *(Continued)*

Simple Logistic Regression							
		Virtual Visits to Initiate MOUD			Virtual Visits to Continue MOUD		
Covariates	**N**	**Unadjusted Odds Ratio**	**95% Wald Confidence Limits**		**Unadjusted Odds Ratio**	**95% Wald Confidence Limits**	
Infrastructure limitations[i] (reference = challenge not experienced)	791	1.49*	1.11	2.00	2.11*	1.50	2.98
Patient-related challenges[j] (reference = challenge not experienced)	791	2.21*	1.60	3.06	2.84*	1.99	4.06
Prescriber Satisfaction with Adaptations							
Virtual visits to maintain MOUD (reference = not satisfied with change)	756	3.54*	2.51	4.99	13.32*	8.90	19.95
Virtual visits to provide behavioral health (reference = not satisfied with change)	756	2.47*	1.84	3.33	4.78*	3.28	6.97
Virtual visits to initiate MOUD (reference = not satisfied with change)	756	18.77*	12.16	29.00	3.82*	2.46	5.91
Expanded virtual visit reimbursement (reference = not satisfied with change)	756	2.09*	1.53	2.85	3.41*	2.17	5.35
Online help groups (reference = not satisfied with change)	756	1.46*	1.06	2.00	1.87*	1.23	2.85
Longer durations/more refills of MOUD	756	2.31*	1.62	3.31	3.54*	2.05	6.11
Multivariable Logistic Regression							
		Virtual Visits to Initiate MOUD			Virtual Visits to Continue MOUD		
Covariates	**N**	**Adjusted Odds Ratio**	**95% Wald Confidence Limits**		**Adjusted Odds Ratio**	**95% Wald Confidence Limits**	
Clinical Profession							
Psychiatry (reference = all other professions)	775	1.57*	1.04	2.38	0.84	0.52	1.37
Years prescribing MOUD (reference category 0–5)							
6–10	775	1.47	0.94	2.31	1.11	0.65	1.90
11–15		0.66	0.41	1.08	1.54	0.82	2.90
More than 15		0.64	0.41	1.00	0.73	0.44	1.22
Number of patients prescribed MOUD per month (reference category <25)							
26–50	775	1.67*	1.06	2.62	1.51	0.86	2.63
51–100		1.03	0.63	1.67	1.10	0.62	1.96
More than 100		1.36	0.86	2.17	1.49	0.86	2.59
Type of MOUD prescribed before COVID-19							
Buprenorphine-naloxone or buprenorphine monotherapy (reference = not prescribed before COVID-19)	775	1.32	0.73	2.39	2.06*	1.11	3.82
In'ectable naltrexone (reference = not prescribed before COVID-19)	775	1.51*	1.10	2.07	1.74*	1.19	2.54
Urbanicity of clinical practice[a] (reference = Rural)							
Suburban	775	2.05*	1.35	3.12	1.22	0.76	1.97
Urban		2.17*	1.48	3.18	1.31	0.84	2.04
Clinical Practice Setting							
Private practice (reference = all 775 other settings)	0.85	0.57	1.25	0.99	0.63	1.55	
Academic medical center (reference = all other settings)	775	1.24	0.78	1.98	2.47*	1.30	40.68
Opioid treatment program (reference = all other settings)	775	0.78	0.51	1.20	0.56	0.34	0.91
Federally qualified health center (reference = all other settings)	775	1.74*	1.08	2.81	1.66	0.90	3.08
Main health insurance of patients							
Public insurance (Medicaid, Medicare, VA, IHS) (reference = not receiving public insurance)	775	1.23	0.87	1.73	1.30	0.87	1.95

*Asterisk indicates statistical significance at $P < 0.05$ level.

[a]Combined covariate of injectable buprenorphine and implantable buprenorphine.

[b]Combined covariate of Medicaid, Medicare, VHA, IHS insurance.

[c]Combined covariate of virtual visits to initiate and maintain MOUD, virtual visits to provide behavioral health care, observed medication administration through video, expanded reimbursements for virtual visit services, online mutual help groups, smartphone counseling applications, online counseling sites.

[d]Combined covariate of medications mailed to patients, urine toxicology surveillance via mail.

[e]Combined covariate of partnering with a patient surrogate, mobile services to assess patients.

[f]Combined covariate of expanded access to take-home methadone and providing longer durations/more refills of prescriptions of MOUD.

[g]Combined covariate of VHA, Indian Health Service, and prison/jail settings.

[h]Combined covariate of shortage of prescribers, non-prescribers.

[i]Combined covariate of reduced funding, difficulty obtaining urine toxicology screens, limited virtual visit capabilities.

[j]Combined covariate of patient barriers in use of telephone/technology, unstable housing, change in local drug supply.

[k]The multivariable model was estimated for prescribers in rural, urban, or suburban settings; prescribers in "other'' settings (n = 21) were not included.

TABLE 4. Themes and Illustrative Quotations from the Qualitative Findings

Theme	Illustrative Quotations
Convenient & "Low Barrier"	"If someone had asked me in December [2019] if I would ever practice telemedicine, I would have said 'heck no.' I never imagined myself in a telemedicine practice. As a result of COVID-19, I was required to transition rapidly to telemedicine practice. . .It has been much busier but also more satisfying in many ways. . .Patients have been very satisfied, and in fact, patient satisfaction has improved and 'no show rates' have dramatically decreased which has improved the outcomes for many patients (especially those who lived at a significant distance from the clinic or with significant financial or transportation challenges)."
Increased patient & provider comfort	"Virtual visits have been a joy, I know my patients much better and outcomes are improved."
	"[I] get to see [patients] in their home and [without] makeup"
	"Patients talk more by telemedicine than before."
	"[I] work better at home, more efficiently and comfortably."
Difficulty adapting to & accessing technology	"[I] miss the direct [patient] interaction and would not do well providing only telehealth."
	"It has been difficult to engage patients who do not have access to a phone. We have purchased phones to distribute among these patients, however it is a major cost for our clinic [and] required diverting funds from other programs."
Liability	"[There is an] increased risk when addressing patients with comorbid alcohol use disorder and managing them via phone."
Flexibility	"Given the increased rates of relapse and medication misuse, not all patients should be automatically shifted to virtual care. Regular in-person meetings are still very important for a subset of patients."

not significantly associated with a preference to continue virtual visits to either initiate or continue MOUD postpandemic.

In sensitivity analyses in which models excluded prescribers practicing in OTPs, we found no evidence of systematic bias in the full-sample conclusions. The direction and magnitude of estimates for full and restricted samples did not change clinical interpretation.

In final multivariable models (Table 3), variables uniquely associated with preference to continue/expand virtual visits to initiate MOUD were being a psychiatrist, treating a moderate (vs small) number of patients each month, practicing in an urban or suburban (vs rural) setting, and practicing in a FQHC. Variables uniquely associated with preference for virtual visits to continue MOUD were prescribing buprenorphine before the pandemic and practicing in an academic medical center. Prescribers working in an OTP were less likely to prefer virtual visits to continue MOUD. The only variable significantly associated with both preference to continue/expand virtual visits to initiate and continue MOUD was having prescribed naltrexone extended-release injection before the pandemic.

In sensitivity analyses, direction and approximate magnitude of predictors included in multivariable analyses were similar.

Qualitative Results

Thematic analysis of free text responses provided context for why participants supported various clinical adaptations. Most survey respondents provided an analyzable response to at least one of the free text questions (n = 476); 87 respondents provided usable text in one field, while the remainder responded (n = 389) to both free text questions. Overwhelmingly, prescribers reported that telehealth was a convenient, low-barrier method of providing care to patients with transportation issues or living in rural areas (Table 4). Positive experiences with virtual visits included increased patient and provider comfort. Some reported negative experiences like difficulty adapting to the reliance of technology, technological barriers among patients, and potential for increased liability. Finally, many felt that flexibility is important, but believed providers should use their clinical discretion to determine whether to apply the adaptation to a particular patient based on clinical need.

DISCUSSION

In this nationwide survey of X-waivered prescribers providing OUD care during COVID-19, we found evidence of wide use of clinical adaptations and general satisfaction with use of virtual visits. Virtual visits to continue MOUD and behavioral healthcare were most commonly reported to have been used during the first 6 months of the COVID-19 pandemic. These same adaptations, and increased reimbursement for virtual visits, were favored by most prescribers to continue/expand after the pandemic regardless of personal experience. Our qualitative findings suggest that providers supported use of virtual visits to provide MOUD because they made care more convenient and accessible for patients, corroborated by other studies.[6,9,17] The expressed preference to continue adaptations by some prescribers who had not used them during the pandemic may reflect indirect experiences with the adaptations, such as having observed or learned about the use of adaptations elsewhere. Pandemic-related limitations such as funding/staffing issues may have prohibited the implementation of the adaptations. Prescriber preference to continue adaptations may suggest a new readiness or capacity to adopt them postpandemic. Fewer prescribers endorsed use of virtual visits to initiate MOUD postpandemic (49%), compared to those who supported virtual visits to continue MOUD (79%). A different national survey study similarly found that most reported using virtual visits to engage existing patients in treatment with a smaller percentage of prescribers initiating buprenorphine remotely during COVID-19.[18] The percentages of prescribers using virtual visits to provide OUD care for existing patients and to initiate buprenorphine in new patients were higher in our study; this may be related to the higher percentage of addiction certified providers in our sample who may feel more comfortable providing virtual care and our exclusion of emergency medicine physicians who were unlikely to provide virtual care.[19]

Fewer prescribers may have used virtual visits to initiate MOUD due to a desire to more closely monitor patients who are being initiated on MOUD by engaging patients in-person and collecting urine toxicology screens. Furthermore, our qualitative findings suggest that some clinicians were concerned about potential for increased patient safety-related liability and technological barriers in using virtual visits, similarly found in other studies.[8,20] A national study of retail prescriptions found a decrease in the number of buprenorphine prescriptions provided to new patients during the pandemic compared to pre-pandemic; clinician hesitancy may be a contributing factor to this concerning trend.[21] Additionally, prescribers may be inexperienced with home-based buprenorphine initiation and thus hesitant to use it even with relaxed policies.

To guide future clinical practice and policies, we sought to identify prescriber factors associated with desire to continue virtual visits to provide MOUD after the pandemic. In the adjusted analyses, prescribers who were psychiatrists, treated a moderate number of patients, worked in suburban and urban settings, and practiced in FQHCs were more likely to support continuing virtual visits to initiate MOUD. Prescribers who provided buprenorphine before the pandemic and practiced in an academic medical center were more likely to endorse continuing the practice of virtual visits to continue MOUD. Compared to internal medicine physicians, the psychiatrists in our sample had more years of experience treating patients with OUD, which may explain their preference to continue virtual visits to provide MOUD postpandemic. Furthermore, as telemedicine originated in the field of psychiatry in the 1950s, it is possible that psychiatrists have more experience with virtual visits and therefore see the merits of its use.[22] Prescribers working in nonrural and academic medical centers may have been supportive as they likely had had more reliable technology and the staffing to accommodate new clinic workflows.[23] While prescribers who treated a moderate versus small number of patients preferred to continue virtual visits to initiate MOUD perhaps due to better access to resources such as virtual technology, prescribers who treated a larger number of patients did not demonstrate a significant preference. The reason for this finding warrants further exploration. By working in underserved areas, prescribers at FQHCs and certain urban areas may have found virtual visits to be a useful tool in expanding access to MOUD. Prescribing extended-release naltrexone injections before the pandemic was the only variable associated with desire to continue/expand virtual visits to both initiate and continue MOUD. This may be because injectable naltrexone would be administered in-person by a healthcare professional (not necessarily the prescriber) during the pandemic, necessitating at least monthly face-to-face evaluations by providers, reducing concerns about patient safety. Prescribers at OTPs compared to prescribers at non-OTP practice settings may have been less likely to prefer virtual visits to continue MOUD due to patient safety reasons as one qualitative study found that some OTP prescribers were concerned about possible increased risk of mediation diversion and overdose and reduction in quality of care.[24]

Overall, our findings demonstrate widespread use and prescriber satisfaction with the adaptation to offer virtual visits to provide OUD care during the pandemic. As MOUD remains underused and locations such as smaller cities have less access to MOUD prescribers, virtual visits are a potential powerful tool to expand access to care.[25,26] However, consistent with another study,[19] many participants also reported challenges in providing MOUD during the pandemic, including patient barriers to using technology and housing instability. Lastly, respondents expressed need for flexibility given some patients with OUD have complex comorbidities and may therefore benefit from in-person evaluation and ongoing assessment.

Limitations

This study should be interpreted in the context of its limitations. First, our convenience sample consisted of X-waivered prescribers engaged with at least one of several listservs and who were able and willing to respond to a survey during this time. Thus, our findings may not be generalizable to prescribers who are not active in one of the listservs, had less time[27] or access to technology during the study period.[19] We also restricted our sample to X-waivered prescribers so findings may not be generalizable to some prescribers working in OTPs. Second, this newly-developed survey was implemented without opportunity for validation, given the time-sensitivity of the topic it addressed. Thus functioning of items is untested. Endorsement rates of response options presented in lengthy lists may cause responder fatigue. Some response options had poor response variability, resulting in limited power to detect their association with the two outcomes; inclusion of a more heterogeneous sample may result in greater variability on select variables. Nevertheless, we met our aim of including active buprenorphine prescribers with 93% of the sample being active prescribers compared to 75.5% of a national sample.[18] The sample also was highly represented by prescribers in primary care, internal/general medicine, and family medicine (66%).[18] Third, as survey questions were optional, there were missing answers. Fourth, the pandemic peaked at different times during the time of data collection; therefore, it is likely that the pandemic differently affected OUD care across regions which our survey could not account for. Fifth, given the qualitative data were derived from optional free text boxes, there may be non-response bias.

CONCLUSIONS

Our study demonstrates widespread use of virtual visits during the pandemic and prescriber desire to continue/expand the opportunity to use virtual visits to provide OUD care even after the pandemic. Virtual visits have the potential to improve access to and engagement with MOUD. Given the sharp rise in opioid overdose deaths and the low rates of MOUD initiation and retention, policymakers should consider modifying policies to facilitate the use of and lower the barriers for virtual visits to provide MOUD (eg, addressing limited access to technology for patients with OUD).[28–30] Future research is needed to understand differences among prescribers who did or did not use available adaptations such as virtual visits during the pandemic, how virtual visits impact the quality of OUD care, MOUD treatment access, and clinical outcomes and to determine which groups of patients and practice settings would best benefit from virtual visits. These data will better equip healthcare systems to more effectively use virtual visits to enhance treatment of individuals with OUD during the ongoing COVID-19 pandemic and beyond.

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