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Narrative Review of Opioid Use Disorder Treatment Changes During the COVID-19 Pandemic and Their Impact on American Indian/Alaska Native Communities

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ABSTRACT

Background: The United States (US) declared drug overdose a public health emergency in 2017. Despite this, two million people reported having an opioid use disorder (OUD) in 2018. However, following the beginning of COVID-19 there was a 53% increase in overdose deaths, with American Indian/Alaska Native (AI/AN) individuals experiencing the highest rates of all racial groups. In response to the COVID-19 pandemic and OUD treatment access challenges, OUD treatment policies were changed to improving access to care.

Purpose: This review examines how the state- and federal-level policies impacted access to medications for opioid use disorder (MOUD) during the COVID-19 pandemic. Due to the devastating impact of overdose and COVID-19 on AI/AN communities, as a secondary aim, we examined the inclusion of these populations in the samples of the included studies.

Methods: We completed a narrative review using a data-based convergent synthesis design.

Results: Forty-four studies met the inclusion criteria. Most of the studies were quantitative descriptive studies ($n = 25$). Only two studies offer AI/AN as a category for ethnicity and both had less that 4% of the sample that identified as an AI/AN individual.

Conclusion and Implications: Telehealth OUD treatment increased initiation and retention for patients taking buprenorphine. No increase in overdose rates was associated with allowing for additional take-home doses of methadone. However, access to treatment, even telehealth, remains difficult for individuals due to a lack of OUD treatment providers and access to the internet. More needs to be done to address the opioid overdose crisis, especially among AI/AN communities. Research focused on cultural strategies to address this health disparity is desperately needed. We included nursing implications in response to this health disparity among AI/AN individuals.

1 | Background

Two million people in the United States (US) reported having an opioid use disorder (OUD) in 2018 (SAMHSA 2020a), with 10.1 million people aged 12 years and older reporting misusing opioids in 2019 (National Center for Drug Abuse Statistics 2021). Prior to the COVID-19 pandemic, OUD treatment policies in the US focused on three general areas: decreasing high-risk opioid prescribing, increasing access to treatment, and increasing access to the overdose reversal agent naloxone (Schuler et al. 2020).

In the US, OUD treatment is generally delivered from a criminal justice philosophical approach, with strict monitoring of treatment (Caulkins et al. 2021; Stauffer 2016). Methadone clinics require individuals to have observed urine drug testing at every clinic visit and allow very limited or no take-home dosing

(Joudrey et al. 2021). In many areas in the US, some evidence-based harm reduction interventions, such as drug testing via fentanyl testing strips and safe consumption sites, are illegal (Kennedy and Kerr 2017; Levengood et al. 2021).

The US declared drug-related overdose a public health emergency in 2017 when the annual overdose death rate reached 70,000 individuals (UNODC 2020). However, following the beginning of the COVID-19 pandemic there was a 53% increase in overdose deaths in the US (CDC 2022). This was particularly true for American Indian/Alaska Native (AI/AN) individuals whose rates of overdose death were the highest among all racial/ethnic groups in the US (NCHS 2021).

Several federal medication for opioid use disorder (MOUD) policy regulations changed during the COVID-19 pandemic. The Substance Abuse and Mental Health Services Administration (SAMHSA 2020b) implemented temporary flexibilities allowing for increased take-home methadone supply of up to 28 days for stable patients and 14 days for less stable patients. The Ryan Haight Act of 2008 required an in-person initial evaluation by any practitioner issuing a prescription for a controlled substance, which limited the use of telehealth for buprenorphine prescribing. The Drug Enforcement Agency (DEA) temporarily waived this, allowing for the use of telehealth (including audio only) for buprenorphine induction and maintenance visits (SAMHSA 2020c).

Subsequent federal and state guidance allowed for additional flexibility in OUD treatment including increasing providers' prescribing capabilities (via the elimination of the X-Waiver), cross-state prescribing, permission to use any non-public facing videoconferencing products, and including payment parity for services delivered via telehealth and in-person (Center for Connected Health Policy 2020; Long 2020; SAMHSA 2020b). The purpose of this narrative review was to examine the impact of MOUD treatment policy changes implemented after the onset of COVID-19. Considering the devastating impact on the AI/AN communities, as a secondary aim we examined inclusion of AI/AN individuals in these studies.

2 | Methods

We completed a narrative review (Ferrari 2015) using a data-based convergent synthesis design (Hong et al. 2017). We chose this method because we anticipated a diverse group of studies, including qualitative and mixed-method studies. The authors are concerned about the history of trauma and the high rates of OUD among AI/AN individuals. Indigenous ways of knowing focus on storytelling (Woods et al. 2021). Including both quantitative and qualitative methodologies is synergistic with Indigenous methodology (Burnette and Figley 2017).

For a methodology to be correctly identified as Indigenous, it must be anchored in Indigenous knowledge development, theory, and ethics (Kovach 2021). Indigenous ways of knowing view knowledge as arising not only from an intellectual realm but also from the affective domain of the heart, the kinetic domain of the body, and the spiritual domain of the soul. Many concepts found in Indigenous methodological research are expressed through stories (Kovach 2021). A two-eyed seeing perspective proposes that both Indigenous and Western ways of knowing are important for building upon existing knowledge (Reiger et al. 2020).

2.1 | Search Methods

The review focused on research studies of US state- and federal-level opioid policy evaluation published in English between December 2019 and March 2023. Search terms included 'Opioid Use Disorder Treatment', 'health policies in United States', and 'COVID-19'. Search was limited to full-text research studies that included only individuals ≥18 years old. The review timeline coincides with the onset of the pandemic to explore what studies have been undertaken since the MOUD policy changes (see Figure 1).

2.2 | Quality Appraisal

The Mixed Methods Appraisal Tool (MMAT) was used to evaluate the studies (Pluye and Hong 2013). MMAT has separate questions for each type of research design, and the latest version of the MMAT encourages a descriptive quality appraisal rather than a numerical score (Hong et al. 2017). This appraisal can be found in Table 2.

2.3 | Data Extraction & Synthesis

We extracted numerical data from quantitative studies and synthesised these data narratively, then abstracted and synthesised data from the qualitative studies (Hong et al. 2017; Thomas and Harden 2008). We deductively coded findings based on the policy changes we were aware took place since the COVID-19 pandemic began: the use of telehealth for buprenorphine prescribing, loosened restrictions on methadone take-home dosing, and x-waiver elimination.

3 | Results

3.1 | Sample

Forty-four studies met the inclusion criteria (See Figure 1). Most of the studies were quantitative descriptive studies ($n = 25$), 17 were qualitative, and two were mixed methods studies. Sample size in the included studies ranged from three in a case study to over 17,182 in a national sample. Twenty-five of the studies focused on patients with OUD, sixteen studies investigated providers' perceptions of the policy changes, and three studies examined to what extent states implemented policy changes.

Fourteen of the 44 studies reported race/ethnicity, and only two of these 14 studies provided an answer option of AI/AN ethnicity as a category for race. Both studies had less than 4% of their sample self-identifying as an AI/AN individual (Ezie et al. 2022; Gliske et al. 2022). One study reported that 32.1% of the sample self-identified as Black, Indigenous, and People of Colour (BIPOC), which included participants who identified as

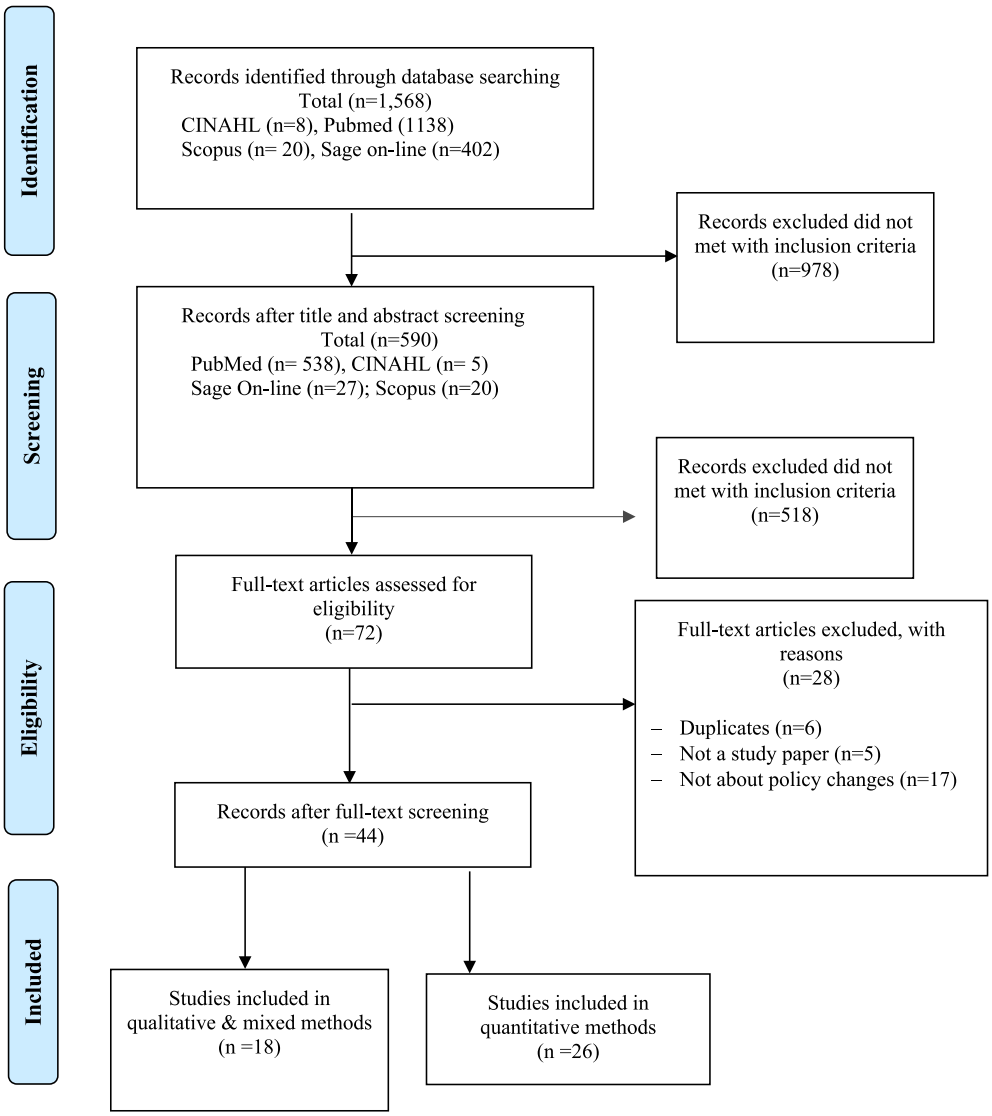

FIGURE 1 | Search results.

one or more of the following: Hispanic, Black, Asian, Indigenous (Meyerson et al. 2022).

3.2 | Quality Appraisal

Table 1 outlines each study including authors, design, sample, setting, and findings. The latest version of MMAT suggests a descriptive quality appraisal rather than a numerical score (see Table 2).

3.3 | Themes

Most of the studies ($n = 25$; see Table 1) described how individuals in OUD treatment during the pandemic were impacted by the policy changes in MOUD treatment. Nineteen studies focused on MOUD providers and their perspectives regarding policy changes for MOUD since the COVID-19 pandemic began. The themes are presented by the OUD treatment policy changes, specifically (1) telehealth for both maintenance and initial initiation of buprenorphine, (2) increase in take-home methadone doses, (3) elimination of x-waiver for buprenorphine prescribers, and (4) state implementation of OUD treatment policy changes.

3.3.1 | Telehealth for Both Maintenance and Initial Initiation of Buprenorphine

In rural counties with low broadband, 82.3% of individuals do not have access to a MOUD provider within 30 miles of their residence (Ali and Ghertner 2023). Providers agreed that telehealth was an important means of increasing access to MOUD treatment (Cales et al. 2022; Levander, Wheelock, et al. 2022), but despite this increased flexibility, many individuals lacked reliable access to technologies (Aronowitz et al. 2021; Hunter et al. 2021). Individuals living in counties with higher household incomes were more likely to be initiated on buprenorphine via telehealth compared to those with lower household incomes (Barsky et al. 2022; Caulfield 2021).

Some providers expressed discomfort in completing intake assessments remotely because they could not observe the individual closely or collect drug screens (Henretty et al. 2021). They

TABLE 1 | Table of evidence.

	Author(s), year	Design	Aims	Sample & setting	Factors
1	Ali and Ghertner (2023)	Quantitative Descriptive Secondary analysis	Telehealth	Race/ethnicity not measured Individuals wuth SUD	Many counties that lacked buprenorphine waivered providers also lack availability of broadband internet 23.9% of US population does not have access to MOUD provider within 30 miles In rural counties with low broadband 82.3% do not have access to MOUD provider within 30 miles
2	Amran et al. (2021)	Quantitative descriptive Cross-sectional survey of pts from a methodone clinic in fall of 2019	Take-home dosing	A convenience sample of 183 clients (58% female) Race/ethnicity measured as Non-Hispanic White Yes/No	Mean take-home doses increased nearly 200% (11.4/30 days pre-COVID vs. 22/30 post SAMHSA exemption) ER visits dropped from 74 (40.4%) pre-Covid to 54 (30.6%) post SAMHSA exemption ($p > 0.001$)
3	Amran et al. (2022)	Quantitative descriptive Cross-sectional study examining transportation and travel burden among clients receiving methadone. The Spokane OTP started allowing increased take-home medication in response to the SAMHSA exemption on March 23, 2020	Take-home dosing	English-speaking clients age 18 years and older receiving methadone for OUD at the Spokane County OTP Race/ethnicity measured as Non-Hispanic White Yes/No 194 clients between 12/2019 to 06/2020; Median age = 40 (IQR 32–51); 56% female; 46% had high school diploma; 10% resided more than 5 miles from clinic	All clients received an increase in take-home doses following the COVID-19 exemption, 94 (48%) clients received an increase of up to 15 take-home doses per month, and 100 (52%) received an increase of 15 and more take-home doses per month
4	Andraka-Christou et al. (2021)	Qualitative descriptive Content analysis of SSA data using Dedoose software	Codes for four general treatment settings to which policies might apply: opioid treatment programs (OTPs), outpatient settings (including office-based buprenorphine treatment), residential/inpatient settings, and nonspecific settings (i.e., not specific to any of the other settings). Researchers then categorised data into one or more of these treatment settings	220 documents from SSA websites of 45 states and Washington, DC. Excludes 5 states Since SSAs issue regulations and disseminate policy information related to many SUD treatment settings (e.g., outpatient treatment, opioid treatment programs) and topics (e.g., SUD treatment facility employment, admission policies, payment policies), analysing the content of SSA policies can provide insight into the wide range of policies with which states responded to the pandemic in the context of SUD treatment	Policy themes: Billing and payment changes Changes to infrastructure and operating procedures Assessment changes Non-pharmacological services changes Pharmacological services changes Documentation changes Staffing flexibility\ies Technology for telehealth Most policy changes involved facilitating telehealth, such as by expanding insurance coverage of this modality, or increasing flexibility in treatment, such as by waiving facility licensure or health assessment requirements The majority of documents (77%) retrieved were in the form of a policy memorandum; other documents included Frequently Asked Questions (FAQs) (18%), PowerPoint presentations (2%), and copies of state executive orders (2%)

(Continues)

TABLE 1 | (Continued)

	Author(s), year	Design	Aims	Sample & setting	Factors
5	Aronowitz et al. (2021)	Qualitative descriptive Explore Philadelphia-based low-barrier, harm reduction oriented, opioid use disorder (OUD) treatment provider perspectives about and experiences with telehealth during the COVID-19 pandemic, and to assess their desire to offer telehealth to patients at their programs in the future		22 OUD tx prescribers and staff working in out-pt program during July and August 2020 Philadelphia	Participants universally voiced that telehealth was an important means of improving access to medication and other care for some patients with OUD Despite the potential to improve access through increased flexibility, the switch to telehealth modalities appeared challenging for marginalised patients with unreliable access to the technologies uncertainty about the future and to what degree practices would shift back toward traditional, in-person approaches
6	Barsky et al. (2022)	Quantitative descriptive Cross-sectional study 4/1/2020–4/30/2021	Telehealth	Medicare advantage claims from OptumLabs Data Warehouse with identified buprenorphine inductions between 1/1/2020 to 4/20/2021 2703 individuals received a buprenorphine induction in study period, 13.9% via telehealth ($M_{age} = 46.2$, SD 14.8); 42.7% women	Patients 70 years or older were less likely to have a telemedicine induction compared with those aged 30 to 49 years (average marginal effect difference, −7.8%; 95% CI [−12.5% to −3.2%]) Did not ask about race/ethnicity Patients living in a county in a higher quartile of median household income were more likely to have a telehealth induction vs. those in the lowest quartile (e.g., average marginal effect difference for first vs. fourth quartile, 6.5%; 95% CI [2.4%–10.7%])
7	Cales et al. (2022)	Quantitative descriptive	Telehealth	The research team conducted this study in Louisville at the largest facility in a network of office-based multi-specialty outpatient addiction clinics in Kentucky, a state hit particularly hard by the opioid epidemic $M_{age=38}$ years; 49.7% males, 50.3% females Sample included 191 people receiving MOUD The sample included 186 Whites (97.5%), two Blacks (1.0%), one Hispanic (0.5%), one other (0.5%), and one declined to answer (0.5%). Insurance coverage was mostly Medicaid (79%), followed by 14% commercial, 6% Medicare, and 1% uninsured	This hybrid approach integrates one-on-one meetings with telehealth services based on patients' eligibility and available space, providing a mutually acceptable solution without adverse effects on participation or outcomes Race/ethnicity measured with following categories: White, Black, Hispanic, Other

(Continues)

TABLE 1 | (Continued)

	Author(s), year	Design	Aims	Sample & setting	Factors
8	Caulfield (2021)	Qualitative ethnography		New York State focusing on telecare for SUD. Participants included providers, people who use drugs or are in tx for OUD and harm reduction activists 14 interviews from Feb 2019-March 2020 No descriptive statistics presented about the sample; no mention of Race/ethnicity	Themes: Connection sorely missed when using telecare for group tx Barriers lifted for some Identity of stable for take-home Continued stigmatisation Resistance strageties for those subject to surveillance by video chat Barrier due to low income
9	Chalasani et al. (2021)	Quantitative descriptive	Take-home dosing	Secondary analysis of PA px drug monitoring program to id all outpt fills for buprenorphine (except transdermal for pain) from Jan to Oct 2019 and 2020 No of px analysed not provided	The onset of the COVID-19 pandemic in Pennsylvania was associated with a reduction in both the number of patients filling buprenorphine prescriptions and new patients initiating buprenorphine. These changes, however, were accompanied by an increase in mean days' supply and no overall change in the number of patients with active buprenorphine prescriptions
10	Cunningham et al. (2022)	Retrospective cohort study	Telehealth	Patients referred to buprenorphine treatment in a Bronx community clinic before (March–August 2019) versus during (March–August 2020) the pandemic We describe changes to buprenorphine treatment during the pandemic, including telehealth and prioritising harm reduction Before and during the pandemic, 72 and 35 patients were referred to buprenorphine treatment, respectively. Patients' mean age was 46 years, most were male (67.3%) or Hispanic (52.3%), and few had private insurance (19.6%) Race/ethnicity measured using Hispanic, Non-Hispanic white, non-Hispaic black, non-Hipsanic other or unknown; no option for AI/AN	Patients referred during (vs. before) the pandemic were more likely to have private insurance (31.4% vs. 13.9%, $p < 0.05$) and be referred from acute care settings (37.1% vs. 19.4%, $p < 0.05$). No significant differences in OUD cascade of care outcomes (initial visit scheduled, initial visit completed, treatment initiated, retained in treatment at 90 days) existed between those referred during versus before the pandemic. However, among patients who initiated buprenorphine treatment, those referred during (vs. before) the pandemic were more likely to be retained in treatment at 90 days (68.0% vs. 42.9%, $p < 0.05$)
11	Ezie et al. (2022)	Quantitative descriptive, retrospective chart review from 12/16/2019–3/15/2020 and 3/16/2020–6/15/2020	Take-home dosing	129 individuals in OUD Tx 128 males, average age 66 years Time in Tx 4.1 years Methodone clinic at the Manhattan VA Medical Center Had AI/AN as option $n = 2$ in sample of 129	There was no statistically significant changes in urine drug screen outcomes for non-prescribed opiates, methadone or any illicit drug (outside of cannabis), which in this study indicated adherence to methadone treatment and minimal change in illicit substance use during Period 1 and Period 2 Program retention was stable which may have affected the ability to see any changes between Period 1 and 2

(Continues)

TABLE 1 | (Continued)

	Author(s), year	Design	Aims	Sample & setting	Factors
12	Figgatt et al. (2021)	Mixed methods study with survey and interview data	Take-home dosing	104 persons receiving methadone from 3 clinics in NC in June and July 2020 54.5% were between 18 and 34 years; 55.9% male; 88.2% white; 54.3% on methadone for > 12 months Race/ethnicity categories: Hispanic/Latino, non-hispanic black, non-hispanic white, other. No AI/AN option	Before Covid-19, the clinic-level percent of participants receiving any amount of days' supply of take-home doses at each clinic ranged from 56% to 82%, while it ranged from 78% to 100% since Covid-19. The clinic-level percent of participants receiving take-home days' supply of a week or longer (i.e., ≥ 6 days) since Covid-19 ranged from 11% to 56%. Among 87 participants who received take-homes since Covid-19, only four reported selling their take-home doses
13	Frost, Austin, et al. (2022), Frost, Sweek, et al. (2022)	Cross-sectional secondary analysis	Telehealth PUD	Data extracted from the VHA Corporate Data Warehouse, an national repository of VHA EHRs Veterans > 18 years who filled at least 1 bupernorphine px in the year following the changes (March 23, 2020 to March 22, 2021) with an OUD dx documented in the 265 days prior to or including the date the 1st px fill during that year Among 17,182 patients, 7094 (41.3%) were aged 30 to 44 years and 6251 (36.4%) were aged 45 to 64 years; 15,835 (92.2%) were male, 14,085 (82.0%) were White, and 16,292 (94.8%) were non-Hispanic There were 6547 patients (38.1%) who had at least 1 video visit, 8524 (49.6%) had at least 1 telephone visit but no video visit, and 2111 (12.3%) had only in-person visits	Among all patients, those who were older (aged at least 65 years vs. 18 to 29 years: adjusted odds ratio [aOR], 1.94; 95% CI, 1.40–2.68) or service connected 50% to 100% (vs non-service connected: aOR, 1.24; 95% CI, 1.09–1.41) were more likely to have any telehealth visits compared with only in-person visits. Those who were male (aOR, 0.74; 95% CI, 0.61–0.91), Black (vs White: aOR, 0.71; 95% CI, 0.61–0.84) or unknown race (vs White; aOR, 0.77; 95% CI, 0.62–0.97), Hispanic ethnicity (aOR, 0.75; 95% CI, 0.59–0.94), or had alcohol use disorder (aOR, 0.84; 95% CI, 0.74–0.95), stimulant use disorder (aOR, 0.64; 95% CI, 0.57–0.72), other drug use disorder (aOR, 0.68; 95% CI, 0.60–0.77), or serious mental illness (aOR, 0.81; 95% CI, 0.71–0.92) were less likely to have any telehealth visits Among 4338 patients who initiated a new buprenorphine treatment episode during the year Following Covid-19 related changes, 1318 (30.4%) were retained at least 90 days from initiation Among 12,844 patients who initiated buprenorphine prior to Covid-19 related changes, 6482 (50.5%) were retained at least 90 days from their first buprenorphine fill during the year following Covid-19 related changes
14	Gliske et al. (2022)	Quantitative descriptive cohort longitudinal study of 1060 (response rate of 29.1%) individuals in OUD tx groups (in-person, hybrid, or virtual care)	Telehealth PUD	Jan 2020–March 2021 at large SUD treatment center in MN Race/ethnicity categories: AI/AN (< 1%), Asian, black, native Hawaiian or PI, white. Biracial, other	No difference by delivery format in continuous abstinence ($\chi^2_2 = 0.4$, $p = 0.81$), overall quality of life ($F_{2,826} = 2.06$, $p = 0.13$), financial well-being ($F_{2,767} = 2.30$. $p = 0.10$), psychological well-being ($F_{2,918} = 0.72$, $p = 0.49$), and confidence in one's ability to stay sober ($F_{2,918} = 0.21$, $p = 0.81$). Those in hybrid programming more likely to report higher level of general well-being than those in virtual programming ($F_{2,917} = 4.19$, $p = 0.01$)

(Continues)

TABLE 1 | (Continued)

	Author(s), year	Design	Aims	Sample & setting	Factors
15	Harris et al. (2022)	Qualitative descriptive	Telehealth & Take-home dosing PUD	Recruited from participants enrolled in a parent study (Repeated does Behavioural intervention to reduce Opioid Overdose, ReBOOT) between august and October 2020 20 individuals in Boston Ma between 18 and 45 years with hx of OUD and overdose $M_{age} = 42$, most were white($n = 16$) 10 identified as men; 9 cis-gender women, and 1 transgender woman Race: white, other or more than one race Ethnicity: Hispanic or not Nothing about AI/AN	Participants described their experiences with Covid-19 driven changes to addiction care (methadone take-homes, televisits for either buprenorphine or behavioural health services, and syringe service outreach) access and engagement as: (1) *liberating* ($n = 7$), (2) *destabilising* ($n = 8$), or (3) *unjust* ($n = 5$). Participants in the *liberating* group found adaptations allowed for increased flexibility, freedom, and safety from Covid-19. This group was mostly housed and had strong social supports that facilitated participation in adapted treatment programs. Covid-19-related changes to addiction treatment disrupted routine and community supports among those in the *destabilising* group. Participants in the *unjust* group felt that adaptations exacerbated inequities as a lack of housing and other social supports prohibited them from benefiting from the relaxed restrictions to methadone or buprenorphine. This group was mostly unhoused and found that adaptations did not adequately mitigate other inequities worsened by public health mandates for unhoused people who use drugs
16	Henretty et al. (2021)	Quantitative Descriptive	Telehealth Providers	133 addiction treatment providers from June–July 2020 (out of 399 providers-33.3% response rate) Ca SUD providers who accept Medicaid	Increase telehealth in delivering individual counselling (67%), intensive outpt services (65%), intake assessments (65%), and group counselling (63%) 27% reported not having enough PPE to tx pts and 41% reported not having enough Covid-19 testing resources Providers may have been uncomfortable doing intake assessments remotely because they could not observe the patient closely or collect biomarkers such as blood pressure and drug tests. Additionally, clinicians were probably not trained to conduct remote intakes. Further, providers may not have made it clear to new patients that they could start treatment via telehealth
17	Hills et al. (2022)	Qualitatitve descriptive	Telehealth & Take-home dosing Providers	$N = 20$ interveiws in late 2020 of key informants in Pinellas County Fl Interviewees were SUD/HIV service providers, Depart of Health, sheriff's office and regional clinical program dm staff	Rapid adaptation to telehealth Modifying service to be consistent with SAMHSA guidance, allow for 'take-home' doses of methadone Barriers included lack of access to technology and retraining staff to accept service differently

(Continues)

TABLE 1 | (Continued)

	Author(s), year	Design	Aims	Sample & setting	Factors
18	Hoffman et al. (2022)	Mixed methods convergent design-quantitatively chart review	Take-home dosing PUD No AI/AN option	Examined OTPs urine drug test (UDT) results, take-home methadone regimens, and tx retention ($n=377$) and semi-structured interview ($n=32$) to explore pt reactions to increased take-home dosing and reduced clinic visits Quant: 93% non-Hispanic white; 51% men with mean age of 40 years (SD = 11); 65% were in the program at beginning of study period and 47% remained through the end of study period Qual: 81% were non-Hispanic white; 50% women $M_{age}=42.6$ years Race categories: white, unknown	Quant: The proportion of positive UDT results or retention rate in treatment did not change. Patients in treatment fewer than 90 days did not have an increase in take-home doses and were more likely to discontinue treatment in the post-Covid period (13% discontinuation pre- Covid vs. 26% post, $p=0.047$). Patients in treatment for 90 to 180 days did not receive more take-homes following the take-home relaxation and their UDT opioid positivity rate increased post-COVID (19% to 33%, $p=0.041$) Qual: Overall, participants found increased take-home doses effective and acceptable without return to substance use. Three themes emerged: (1) value of feeling trusted with increased responsibility; (2) reduced travel time permitted increased employment and recreation; and (3) reduced exposure to individuals less stable in recovery and potential triggers
19	Hunter et al. (2021)	Qualitative descriptive	Telehealth & Take-home dosing Providers	Semi-structured interviews between May and June 2020 20 clinicians approved to dispense methadone in OTPs recruited from Medscape's online platform (from 13 states; 55% male; 75% physicians; 50% in partice 9 years or less) who were either a physician, NP or PA who worked in an OTP at least 8 h a week and treated individuals with methadone	Most clinicians (72%) indicated their OTPs had changed the frequency of methadone dispensing. There was variation in implementation of increased 'take-homes', with clinicians considering patient risk or stability when determining the number of take-home doses Most clinicians required in-person visits for induction of new pts and 45% reported not accepting new pts for a period of time About a third of clinicians stated their OTPs had not changed their toxicology screening protocols. About a quarter discussed screening less frequently, using a system based on patient risk. Some clinicians expressed concern over the potential increased risk as a result of less frequent screening A majority of respondents (85%) reported that their OTP offered telemedicine services at the time of the interview. Although some clinicians reported prior experience with telemedicine, a little less than half (44%) reported that it was a new experience Clinicians described a similar set of barriers to conducting video visits, especially patient lack of access to the technology (e.g., no smart phone, lack of data on phone, no Internet access) or limited digital literacy Most clinicians (82%) indicated that patients have responded positively to telemedicine, because it saves time, reduces risk of Covid-19 infection, removes transportation barriers, and is more flexible A little over half of clinicians also mentioned the positive impacts of new delivery models (telemedicine in particular), including learning more about patients' environments Most clinicians (63%) expressed that they wanted to continue providing care through telemedicine, but expanded reimbursement would need to continue to make it feasible

(Continues)

TABLE 1 | (Continued)

	Author(s), year	Design	Aims	Sample & setting	Factors
20	Huskamp et al. (2021)	Quantitative descriptive survey study	Telehealth Provider	Administrered via WebMD/Medscape's online clinician panel fall 2020 602 clinicians (physicians, psychiatrists, NPs or CNSs, & PAs) 40% were physicians 38.2% in large city and 37% suburb near large city; 31.7% finished education 5–10 years ago where 35.9% had over 16 years experience; 25.5% of their pts. had private insurance and 27% had medicaid	Approximately 30% used telemedicine for most initiations while 40% used only in-person visits. The majority (55.8%) expressed at least some discomfort with using telemedicine for treating new OUD patients, although clinicians with more OUD patients were less likely to express such discomfort
21	Jones et al. (2022)	Quantitative design Interupted time-series analyses	Take-home dosing No descriptive data on sample	Secondary analysis of CDC National Vital Statistics System cause of death 2019–2020 and 2021 provisional data were used No demographic data on sample	ITSA-estimated monthly overdose deaths without involving methadone increased by 78.12 (95% CI, 53.69–102.55; $p < 0.001$) deaths per month before March 2020, by 1078.27 (95% CI, 410.08–1746.46; $p = 0.003$) deaths in March 2020, and by 69.07 (95% CI, 15.45–122.70; $P = 0.01$) deaths per month after March 2020 (figure and table). Trend slopes were similar be- fore and after March 2020 (−9.05 [95% CI, −67.98 to 49.88]; $p = 0.76$) Methadone-involved overdose deaths increased by 94.12 (95% CI, 45.38–142.86; $p < 0.001$) deaths in March 2020. Monthly methadone-involved overdose deaths remained stable after March 2020 (−1.91 [95% CI, −5.50 to 1.68]; $p = 0.29$). Trend slopes were similar before and after March 2020 (−1.79 [95% CI, −6.11 to 2.54]; $p = 0.41$) STATA ITSA-estimated percentages of overdose deaths involving methadone declined 0.06% (95% CI, −0.10% to 0.01%; $p = 0.02$) per month before March 2020, increased by 0.69% (95% CI, 0.22%–1.15%; $p = 0.006$) in March 2020, and declined 0.05% per month (95% CI, −0.08% to 0.02%; $p = 0.001$) after March 2020. Trend slopes were similar before and after March 2020 (0.01% [95% CI, −0.05% to 0.06%]; $p = 0.82$) The percentage of overdose deaths involving methadone declined at similar rates, approximately 0.05% to 0.06%, before and after the take-home policy change, with 4.5% of overdose deaths involving methadone in January 2019 and declining to 3.2% by August 2021

(Continues)

TABLE 1 | (Continued)

	Author(s), year	Design	Aims	Sample & setting	Factors
22	Krawczyk, Bunting, et al. (2021); Krawczyk, Garrett, et al. (2021)	Qualitative descriptive	Telehealth & Take-home dosing No race PUD	We reviewed the two most frequently visited opioid subreddits '*r/Opiates*' and '*r/OpiatesRecovery*' to better understand the experiences of people engaged in opioid use or seeking treatment during the pandemic 1000 subreddits from March 2020 to May 2020 (total post in that time 2000) No data on race/ethnicity	Themes: Concern of closure of OUD tx services Transition to telehealth Methadone tx requirements and increased exposure to COVID Reactions to changing regulations on medications for OUD— Studies using unsolicited social media data in real-time to capture experiences of persons with stigmatised behaviours and conditions are valuable for highlighting voices that often go unheard but are critical for generating humane and effective public health responses
23	Krawczyk et al. (2022)	Quantitative descriptive	Take-home dosing Provider	Online survey 103 OTPs licensed by PA D of Drug & alcohol Programs 47% OTPs responded to survey	66% endorsed extending take-home supplies of methadone, agreed that telehealth for buprenorphine and extended take-home methadone reduced pt burden in accessing medications and preventing covid exposure while not significantly increasing risk of overdose
24	Lai et al. (2022)	Quantitative descriptive	Take-home dosing Provider	Survey sent to 890 Mayo Clinic primary care providers in 5 US states, $N = 123$ (13.8% response rate) Minnesota, Wisconsin, Iowa, Arizona, & Fla	35.8% agreed removal of waiver training was a positive step 34.4% reported perceived institutional support in px buprenorphine Providers in practice for 11–20 years more likely to refer OUD pts to specialists
25	Lambdin et al. (2022)	Quantitative descriptive	Telehealth No race PUD	May 2020 the Bright Health SSPs began offering MOUD via two-way video connections with wavered provider in California From May 28, 2020 to March 26, 2021 $N = 114$ SSP participants inducted onto buprenorphine; 58% were between 30 and 49; 28% cisgender female. No data on race	87% inducted same day as referral; 92% had Medicaid or Medicare, 4% private insurance, 4% self-pay 64% returned for 2nd visit 26% more likely to be retained in care for 12 months compared to those receiving in-person MOUD
26	Levander, Pytell, et al. (2022)	Quantitative descriptive	Take-home dosing Provider	Online REDCap survey to regional and state chapter members of the American Association for the Treatment of Opioid Dependence (AATOD), which includes 28 states and DC 170 reponses which was a 17% response rate; 71% adm leaders, 69% from for-profit OTPs and 54% from South. Self-identify as OTP leader who could describe their OTP's responses to COVID and provided responses for primary outcomes	89 (52%) reported routinely allowing for 14 days of take-home methadone doses for 'less stable' patients, and 112 (66%) reported routinely allowing for 28 days of take-home methadone doses for 'stable' patients Factors that determined stability 52% said ongoing non-prescribed opioid and 52% sedative use Of participants from nonprofit clinics, 58% reported they were moderate-to-very concerned about the financial impact related to these policy changes compared to 33% from for-profit and 33% from other types of clinics ($p = 0.02$)

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TABLE 1 | (Continued)

	Author(s), year	Design	Aims	Sample & setting	Factors
27	Levander, Wheelock, et al. (2022)	Qualitative Descriptive	Telehealth No race PUD	Three case studies that show how policy changes that allow telehealth buprenorphine can engage more people in treatment Portland, Oregon No info on race	These cases illustrate the possibilities of buprenorphine initiation without first conducting an in-person clinical assessment, including via telephone only, to reach vulnerable patient populations previously not engaged with addiction treatment
28	Lin et al. (2022)	Quantitative descriptive Secondary analysis of VHA Corporate Data Warehouse to compare trends in buprenorphine tx 12 months before and after federal-level Covid policy changes	Telehealth PUD No race	Prepandemic period march 2019 to February 2020 Pandemic period March 2020 to February 2021 Monthly rolling cohorts of VHA pts with OUD dx during study period No info of race	The total number of VHA patients receiving buprenorphine for OUD increased from 13,415 in March 2019 to 15,339 in February 2021 (14%) Interrupted time-series analysis showed that in the 12-month pre pandemic period, buprenorphine treatment was increasing at a rate of 103 patients per month ($p = 0.001$) (Table 1). In the 12-month period after the start of COVID-19-related policy changes, the number of patients receiving treatment continued to in- crease, but at a rate of 47 patients per month ($p = 0.001$) The proportion of telehealth visits (telephone and video) increased dramatically, from 11.9% (1025 of 8589 visits) in March 2019 to 82.6% (7326 of 8870 visits) in February 2021 The proportion of telephone visits increased and remained the most prevalent modality in February 2021 (50.2%; 4456 of 8870 visits), followed by video visits (32.4%; 2870 visits) and in-person visits (17.4%; 1544 visits) In the pandemic period, the proportion of patients receiving video or telephone visits did not differ substantially by rural/nonrural residence
29	Levander, Pytell, et al. (2022); Levander, Wheelock, et al. (2022)	Qualitative descriptive related to pt exp with telehealth MOUD during Covid	Telehealth No AI/AN PUD	Recruited from Harm Reduction and Bridges to Care between Nov 2019–March 2021 Oregon $N = 19$ 84% white, 79% stably housed, 53% male Race categorised as: white, black, hispanic	63% preferred virtual visits Two themes: availability-accomodation and acceptability-appropriateness Availability-accommodation reflected participants' desires for immediate services and reduced transportation and work or caregiving scheduling barriers, which was facilitated by virtual visits. The acceptable-appropriate domain articulated how participants felt connected to their providers, whether through in-person interactions or the mutual trust experienced during virtual visits

(Continues)

TABLE 1 | (Continued)

	Author(s), year	Design	Aims	Sample & setting	Factors
30	Mandavia et al. (2022)	Quantitative descriptive	Telehealth Providers	691 NYS Office of Addiction Services & Supports tx programs & 24 NYSDOH licensed harm reduction programs (total population = 715) with recruited sample = 358 (response rate of 50.1%) Sample decreased to 227 eliminating surveys with incomplete data and from duplicate organisations 227 respondents, 78% self-identified as administrators and 21.6% as providers; 52.5% certified outpt services; 12% certified opioid tx programs, 18.4% residential, 6.7% harm reduction, 3.1% crisis services, 4.5% prevention programs and 1.8% OBOT	Overall, 80% of respondents supported maintaining expanded insurance coverage and virtual behavioural health/counselling visits. Approximately 70% of respondents supported continued expanded reimbursements for telehealth visits/services. Nearly 60% supported maintaining virtual medication initiation/maintenance visits and reductions in prior authorizations. At least 50% of respondents supported maintaining expanded Naloxone prescriptions, street teams to assess patients who are homeless, and flexibility in assessment for take-home requirements for medication/other treatment Using multinomial logistic regression revealed that respondents within certified outpatient service programs were significantly more likely to support maintaining expanded reimbursements for telehealth visits and services ($p = 0.012$), virtual medication initiation ($p = 0.002$), and maintenance ($p = 0.001$) visits when compared to respondents within certified residential service programs However, Certified outpatient service program respondents were significantly less likely to endorse maintaining expanded access to take-home methadone ($p < 0.001$) than respondents within certified opioid treatment programs
31	Meyerson et al. (2022)	Qualitative descriptive Structured interviews	Telehealth & Take-home dosing	Field interviews with 131 people on methadone &/or buprenorphine at some point during Covid (1/1/2020 to 3/31/2021) Arizona, individuals being treated for OUD in study period $M_{age} = 37.9$ (SD = 11.1) The sample overrepresented the distribution of buprenorphine patients among MOUD patients (25.2% in sample vs. 13.2% in 2015 nationally; Arizona data not available for 2015) 32.1% self-identified as BIPOC (Hispanic, black, Asian, indigenous or multi-racial) PUD	32.1% of the sample self-identified as BIPOC (Black, Indigenous and people of colour) which included all participants who self-identified as one or more of the following: Hispanic, Black, Asian, Indigenous, or multi-racial; although, In 2020 17.4% of Arizona's overall population self-identify as BIPOC 70.9% cismale; 84.7% heterosexual; 43.3% housing affected by covid; 71.8% urban; had to go to clinic daily 51.9%; commute time to provider $M_{minutes} = 23.3$ (SD = 15.7) Themes: Risk of severe outcomes from Covid-required in-person—For many participants, telehealth services were not structured to keep them at home because they were required to come to the clinic where they used a clinic computer or phone to speak to a provider who was offsite While everyone offered additional take-home doses appreciated them and wanted more of them, among all MOUD patients, *no one* reported receiving the maximum allowed for stable patients (28 days) or the maximum allowed for unstable patients (14 days) Arizona is one location where federal MOUD access flexibilities were generally not experienced by patients. This may be a function of MOUD provider implementation challenges, provider beliefs about various flexibilities, or a function of the significant leeway states have with implementing policy changes about substance use treatment

(Continues)

TABLE 1 | (Continued)

	Author(s), year	Design	Aims	Sample & setting	Factors
32	Nesoff et al. (2022)	Qualitative descriptive Text analysis of state-level support for federal tx expansion identified through the COVID-19 US State Policy Database as of mid-April 2020	Telehealth & Take-home dosing 50 US states and DC Policies	Evaluate the impact of policy changes on no of clients tx for SUD > 18, rate of MOUD tx at OTPs/100,000; percent of total state population with SUD State-level policies as of 4/13/2020 for all 50 states and DC in regard to: emergency prescription of oral schedule II controlled subtances; extended take-home doses of MOUD; home-delivery of take-home medications; telehealth for schedule II–IV prescriptions; telehealth for initiation of buprenorphine prescribing; and waiver of out-of-state DEA registration Impact of policy change evaluated by comparing to type of policy to SUD state-level indicators for 2017: # of clients in tx for SUD over 18; rate of MOUD tx facilities with OTP/100,000; % of total state population with SUD; % of total population needing tx but not receiving it	27/50 states enacted at least one of the policies 24 states enacted no policies 17 states (33%) implemented emergency prescription of oral schedule II Only Arizona and Nevada implemented the out-of-state DEA registration exemption 14 states (27%) implemented extended take-home doses for MOUD 8 states (16%) implemented home-delivery of take-home medications 12 states (24%) implemented telehealth for schedule II–IV 10 states (20%) implemented telehealth for initiation of buprenorphine
33	Pagano et al. (2021)	Qualitative descriptive	Telehealth CA Provider	17 directors of 20 residental SUD tx programs	'Program-level impacts' were decreased revenue from diminished client census and insufficient resources to implement infection control measures 'Staff impacts' included layoffs, furloughs, and increased physical and emotional fatigue 'Client impacts' were delayed treatment initiation; receipt of fewer services while in treatment; lower retention; and economic and psychosocial barriers to community re-entry 'Use of telehealth' included technical and interpersonal challenges associated with telehealth visits. 'Program needs' were personal protective equipment (PPE), stimulus funding, hazard pay, and consistent public health guidance 'Positive effects' of the pandemic response included increased attention to hygiene and health, telehealth expansion, operational improvements, and official recognition of SUD treatment as an essential health care service
34	Pessar et al. (2021)	Quantitative descriptive Secondary analysis of data from government and nonprofit agencies from Sept 2020 to January 2021	Telehealth & no waiver Policies National	Examined heterogeneity of policy elements adopted across stated during Covid-19 specifically related to telehelaht, privacy, licensing, and MOUD	All states adopted at least 1 telehealth policy, only 17 adopted telehealth policies to improve acess to MOUD for new pts. Only 9 states relaxed privacy lawsthus limiting telehealth visits. All states adopted at least 1 policy r/t HCP licensing premissions, but only 35 expanded to PAs and NPs

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	Author(s), year	Design	Aims	Sample & setting	Factors
35	Saloner et al. (2022)	Quantitative descriptive survey study	Telehealth & Take-home dosing	Study participants were recruited from a convenience sample of 21 drug treatment and harm reduction programs from DC, Maine, Mar land, Michigan, New Jersey, New Mexico, New York, Pennsylvania, Tennessee, and West Virginia Tx pre and since covid: 52.7% male; 40.8% age 51–75; 46.8% white; 49.5% serous health condition; 30.5% < hs education; 54.1% Medicaid; 18.7% homeless; 21.8% food insecure 316 individuals who reported engaging in SUD tx prior to and since covid Race categorised as Hispanic, NHblack, NHwhite, NH other No AI/AN option PUD	Among people in treatment for OUD pre and since Covid-19 ($N = 287$), the majority consistently received some MOUD. The most common medication received was methadone: 86.1% pre Covid-19 and 87.1% since COVID-19 ($p = 0.71$) Other medications were less common: buprenorphine, 12.5% pre Covid-19 and 10.5% since Covid-19 ($p = 0.43$) and naltrexone, 1.4% pre Covid-19 and 0.7% since ($p = 0.41$) Among persons receiving methadone: 78.6% reported counselling was switched to video or phone, 76.1% reported more take-home days, 21.8% decreased urine drug testing Among persons receiving buprenorphine, 77.8% reported more medication management visits by phone or video, 40.7% more prescribed days, and 37.0% had decreased urine drug screenings
36	Samuels et al. (2022)	Quantitative descriptive Retrospective cohort study March–June 2020 at four clinics affiliated with medical centers in NYC, Phili, SF, & RI	Telehealth	Individuals receiving tele-bupernorphine for tx initiation or maintenance were included in analysis Race categorised as Black NH White NH Latinx, other No AI/AN option PUD Across all sites 150 people received tele-bupernorphine; 76% male 23% Black non-Hispanic; 16% Hispanic/Latinx; 74% on Medicaid; $M_{age} = 43$ (range 20–73) 85% were treatment initiation visits; 83% returns for tx visit within 30 days	¾ sites had bridge clinics Telehealth conducted during COVID-19 has shown that individuals who are Black, Latinx/Hispanic, older, lower income, and female are less likely to use video-based telehealth services Longer term outcomes research is needed to evaluate audio-only versus video-based telehealth and in-person visits, but these data show that it is a promising low-barrier strategy to improve treatment access

(Continues)

TABLE 1 | (Continued)

	Author(s), year	Design	Aims	Sample & setting	Factors
37	Spetz et al. (2022)	Quantitative descriptive	Waiver Providers	Secondary analysis of quarterly DEA for Q2 of 2018 (ending 6/30) through Q4 of 2021 (ending 12/31/2021) Prepandemic operationalised from 2018 Q2 through 2020 Q1 Pandemic from starting Q2 2020 Focusing on number of clinicians with waivers before and during pandemic using national data In Q2 of 2018, 47,912 clinicians had waivers to prescribe buprenorphine, including 40,405 physicians (84.3%), 5937 APNs (12.4%), and 1570 PAs (3.3%). In Q4 of 2021, there were 99,481 clinicians with waivers, including 69,089 physicians (69.4%), 24,127 APNs (24.3%), and 6265 PAs (6.3%). Before the pandemic, the number of waivers grew at a mean (SD) of 4234 (608.2) per quarter compared with 3133 (1685.8) per quarter during pandemic	During the prepandemic period, mean (SD) quarterly growth in 30-patient waivers was 3287 (594.8) compared with 1501 (1234.4) during the pandemic. Between Q3 and Q4 of 2021, the net 30-patient waiver growth was only 157 clinicians. In contrast, the mean quarterly growth for 100-patient waivers increased from a mean (SD) of 709 (298.1) in the prepandemic period to 1316 during the pandemic, and the mean (SD) quarterly growth of 275 patient waivers increased from 238 (103.4) in the prepandemic period to 316 (88.7) during the pandemic
38	Suen et al. (2022)	Qualitative descriptive Modified GT methods	Take-home dosing	Patients with diverse MOUD treatment experiences, duration, and treatment stability, and varied in Covid-19 exposure and risk (e.g., experience with quarantine due to Covid-19 exposure/infection or had comorbidities associated with Covid-19 vulnerability). We oversampled patients who were new to MOUD treatment to increase likelihood of exposure to Covid-19-related regulatory changes San Francisco California 10 providers (2 MDs, 5 SW, & 3 NPs) and 20 patients median age 51 years 52% male PUD & Providers Nothing about race	Federal exemptions in response to Covid-19 led to unprecedented expansion of access to MOUD take-homes with few adverse outcomes Themes: Providers were cautious about expanding take-home dosing Providers highlighted equity as guiding decision on take-home px Both pts and providers noted increased patient autonomy, transparency, and tx stability after receiving take-homes Providers wants to maintain flexibility in take-home policies
39	Sugarman et al. (2021)	Quantitative survey design	Telehealth	58 adults receiving SUD outpt tx *M* (SD) = 45.5(14.5); 66% male; 45% post-graduate education; 43.4% employed full-time; 92.2% white; 58.5% alcohol; 24.5% smoke tobacco Telehealth with providers at McLean hospital Nothing about race PUD	1st study of pt.'s perceptions of telehealth for outpt SUD tx during Covid 86.2% reported they were 'very satisfied' with quality of telehealth care 17.2% started tx. After telehealth transition; 48.3% report weekly telehealth visits; 89.7% like that they can do it from home; 82.8% like saving commuting time; 27.6% reported they don't connect as well with other group members in group tx on line

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	Author(s), year	Design	Aims	Sample & setting	Factors
40	Swann et al. (2022)	Quantitative descriptive Nov–Dec 2022 1873 LHDs from the National Association of County & City Health Officials in 42 states. Sample was 214 (11.4% response rate)	Telehealth	29.9% health directors, administrators; 17.6% OUD program managers; 13.2% health education/promotion; 6.4% nurse administrators or scientists From 37 out of the 42 states Final sample 187 Providers	School-based prevention programs had termination rate of 17.2% (95% CI = 11.4%–25.1%) 72.2% (95% CI = 62.7%–80.0%) of LDHs reported continuing telehealth options for OUD at an increased level. Increased addiction counsellors to provide non-medication tx for OUD (12.4%, 95% CI = 7.5%–19.8%) and increase in px of medications for OUD (10.0%, 95% CI = 5.7%–16.7%) Prevention services had highest rate of d/c across all services
41	Textor et al. (2022)	Qualitative semi-strucutred interviews and participant observation	Telehealth No race	Sample: 19 patients, 24 providers and clinic staff, 10 pharmacists May 2020–May 2021 PA and CA Telehealth for OUD Tx welcomed, but pharmacy-level barriers persist. Nothing about race	Perceived threats of Drug Enforcement Administration (DEA) enforcement, and self-defensive institutional practices in pharmacies, reinforce ideologies of drug law enforcement, leading to poor patient outcomes including lack of buprenorphine access
42	Treitler et al. (2022)	Qualitative descriptive rapid analysis approach	Telehealth & Take-home dosing	Out of a population of 70 OTP and OBAT providers they interviewd 20 (6 OPT amd 14 OBAT) during Covid-didn't give dates New Jersey Providers	Based on providers' experience with the Covid-19 era 'natural experiment' of regulatory waivers, that the temporary flexibilities should be made permanent All providers interviewed expressed a desire for federal policies to continue allowing expanded use of telehealth (including remote initial evaluation for patients starting buprenorphine and the option of audio as well as video platforms); the ability to flexibly adjust the use of take-home doses of methadone in OTPs; and reimbursement for telehealth on par with in-person visits
43	Uscher-Pines et al. (2020)	Qualitative descriptive	Telehealth	April 15–24, 2020 completed 18 semi-structured interviews with MOUD providers from 10 different states in US who held waiver, had at least one OUD pt/week, > 50% time in outpt setting	Impact of telehealth on patient interactions: negative-less structure & accountability, less info to inform decision-making, difficulty to connect, tech challenges. Positive-increased access, reduced anxiety
44	Walters et al. (2022)	Qualitative descriptive	Telehealth PUD	June–October 2020 Race not measured 37 individuals who use drugs (13 on buprenorphine, 11 on methadone, three previously on bupernorphine, four previously on methadone, and six people who used drings but not on tx) and 18 with MOUD providers	Those on MOUD, also reported that the changes reduced stigma associated with clinic attendance. However, some participants reported adverse effects, such as decreased availability of basic resources, such as food, clothes, and harm reduction materials, which were previously distributed at some MOUD clinics

TABLE 2 | Mixed methods appraisal tool (Hong et al. 2017) quantitative, qualitative & mixed methods studies.

Quantitative randomised controlled trails	**Are there clear research questions?**	**Do the collected data allow to address the research questions?**	**Is randomisation appropriately performed?**	**Are the groups comparable at baseline?**	**Are there complete outcome data?**	**Are outcome assessors blinded to the intervention provided?**	**Did the participants adhere to the assigned intervention?**
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Quantitative non-randomised	**Are there clear research questions?**	**Do the collected data allow to address the research questions?**	**Are the participants representative of the target population?**	**Are measurements appropriate regarding both the outcome and intervention (or exposure)?**	**Are there complete outcome data?**	**Are the confounders accounted for the design and analysis?**	**During the study period, is the intervention administered (or exposure occurred) as intended?**
Cunningham et al. (2022)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Ezie et al. (2022)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Quantitative descriptive	**Are there clear research questions?**	**Do the collected data allow to address the research questions?**	**Is the sampling strategy relevant to address the research questions?**	**Is the sample representative of the target population?**	**Are the measurements appropriate?**	**Is the risk of nonresponse bias low?**	**Is the statistical analysis appropriate to answer the research questions?**
Ali and Ghertner (2023)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Amran et al. (2021)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Amran et al. (2022)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Barsky et al. (2022)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cales et al. (2022)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Chalasani et al. (2021)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Figgatt et al. (2021)	Yes	Yes	Yes	No	Yes	Not sure	Yes
Frost, Austin, et al. (2022); Frost, Sweek, et al. (2022)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Gliske et al. (2022)	Yes	Yes	Yes	Yes	Yes	Yes	Yes

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TABLE 2 | (Continued)

Henretty et al. (2021)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Huskamp et al. (2021)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Jones et al. (2022)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Krawczyk et al. (2022)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Lai et al. (2022)	Yes	Yes	Yes	No	Yes	No	Yes
Lambdin et al. (2022)	Yes	Yes	Yes	Not Sure	Yes	Not Sure	Yes
Levander, Pytell, et al. (2022)	Yes	Yes	Yes	No	Yes	No	Yes
Lin et al. (2022)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Mandavia et al. (2022)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Nesoff et al. (2022)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Pessar et al. (2021)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Saloner et al. (2022)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Samuels et al. (2022)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Spetz et al. (2022)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sugarman et al. (2021)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Swann et al. (2022)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Qualitative methods study	**Are there clear research questions?**	**Do the collected data allow addressing the research questions?**	**Is the qualitative approach appropriate to answer the research question?**	**Are the qualitative data collection methods adequate to address the research question?**	**Are the findings adequately derived from the data?**	**Is the interpretation of results sufficiently substantiated by data?**	**Is there coherence between data source, collection, analysis, and interpretation?**
Andraka-Christou et al. (2021)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Aronowitz et al. (2021)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Caulfield (2021)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Harris et al. (2022)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Hills et al. (2022)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Hunter et al. (2021)	Yes	Yes	Yes	Yes	Yes	Yes	Yes

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TABLE 2 | (Continued)

Krawczyk, Bunting, et al. (2021); Krawczyk, Garrett, et al. (2021)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Levander, Wheelock, et al. (2022)	Yes	Yes	Yes	Yes	Yes	Not Sure	Yes
Lockhard et al. (2022)	Yes	Yes	Yes	No	Not Sure	Not Sure	Not Sure
Meyerson et al. (2022)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Pagano et al. (2021)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Suen et al. (2022)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Textor et al. (2022)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Treitler et al. (2022)	Yes	Yes	Yes	Yes	Yes	Not Sure	Yes
Uscher-Pines et al. (2020)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Walters et al. (2022)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Mixed methods studies	**Are there clear research questions?**	**Do the collected data allow for addressing the research questions?**	**Is there an adequate rationale for using a mixed method design to address the research questions?**	**Are the different components of the study effectively integrated to answer the research question?**	**Are the results adequately brought together into overall interpretation?**	**Are divergences and inconsistencies between quantitative and qualitative results adequately addressed?**	**Do the different components of the study adhere to the quality criteria of each tradition of the methods involved?**
Hoffman et al. (2022)	Yes	Yes	Yes	Yes	Yes	Yes	Yes

also reported concern about the minimal training that providers received to complete treatment intakes via telehealth (Henretty et al. 2021; Hills et al. 2022). A secondary analysis of the Veterans Health Administration data examining trends in buprenorphine treatment 12 months before and after federal-level COVID policy changes found that the proportion of telehealth visits increased from 11.9% (1025 of 8589 visits) in March 2019 to 82.9% (7326 of 8870 visits) in February 2021 (Lin et al. 2022). Among MOUD providers in New York, 60% supported maintaining virtual MOUD initiation and maintenance visits and reducing required prior authorizations (Mandavia et al. 2022). Some positive effects of the pandemic response that providers listed were telehealth expansion and official recognition of OUD treatment as an essential health care service (Pagano et al. 2021) and increased access (Uscher-Pines et al. 2020).

From a national sample of 602 MOUD providers, 55.8% expressed discomfort with using telehealth for intake, although providers with more patients were less likely to express discomfort (Huskamp et al. 2021). One hundred and three MOUD providers in Pennsylvania agreed that telehealth for buprenorphine reduced patient burden in accessing treatment and preventing COVID-19 exposure while not significantly increasing the risk of overdose (Krawczyk et al. 2022). In fact, individuals that initiated buprenorphine during the pandemic were more likely to be retained in treatment at 90 days compared to individuals that were initiated before the pandemic (68.0% vs. 42.9%, $p < 0.0.05$; Cunningham et al. 2022). In a large study of veterans, 50.5% of veterans who started buprenorphine during COVID were retained in treatment for 90 days (Frost, Austin, et al. 2022; Frost, Sweek, et al. 2022). Longitudinally, individuals who initiated treatment via telehealth during COVID were 26% more likely to remain in treatment for 12 months as compared to individuals who initiated treatment in-person (Lambdin et al. 2022). Seventy-six percent of individuals receiving buprenorphine in harm reduction and treatment programs across 10 states reported appointments changing to telehealth, 40.7% reported receiving more prescribed days, and 37% reported less urine drug testing (Saloner et al. 2022).

Early in the pandemic a review of subreddit texts found that individuals on MOUD expressed concern of OUD treatment services closure (Krawczyk, Bunting, et al. 2021). However, once telehealth treatment services began, individuals on MOUD reported that the availability and accommodation of telehealth reduced their travel and allowed more time for work and childcare. Some also stated that they felt as connected to their provider as if the visits were in-person and appreciated the mutual trust experienced during virtual visits (Lockhard et al. 2022). Some individuals reported being very satisfied with telehealth (Sugarman et al. 2021) and that the changes were positive because they decreased the stigma associated with clinic attendance (Walters et al. 2022). However, despite loosened federal restrictions, some clinics and treatment providers did not choose to offer flexibility to patients. For example, patients across Arizona reported that telehealth services were not structured to keep them at home since they were required to come into the clinic and use the clinic computer or phone to speak with providers who were offsite (Meyerson et al. 2022). Older racially-minoritized women with low household income were less likely to use video-based telehealth services (Samuels et al. 2022). Additionally, pharmacy-level barriers to buprenorphine, prompted by pharmacist hesitancy or refusal to stock and dispense the medication, might negatively impact telehealth's potential to increase access (Textor et al. 2022).

3.3.2 | Increase in Take-Home Methadone Doses

In one study, take-home methadone dosing increased nearly 200% (11.4/30 days pre-COVID versus 22/30 post SAMHSA exemption) with a decrease in emergency room visits from 74 pre-COVID to 54 post SAMHSA exemption (Amran et al. 2021, 2022). A chart review revealed no changes in urine drug testing outcomes for non-prescribed opioids, methadone, or any illicit drug indicating adherence to methadone treatment with increased take-home dosing (Ezie et al. 2022). In fact, the proportion of positive urine drug testing results or retention in treatment did not change from the pre- to post-COVID period. Individuals in treatment valued feeling trusted with increased responsibility, reduced travel time allowing for increased employment and recreation, and reduced exposure to individuals less stable in recovery that could increase triggers (Hoffman et al. 2022). In a survey study of 21 harm reduction and treatment programs across 10 states, 78.6% of individuals on methadone reported counselling switched to telehealth, 76.1% reported more take-home days, and 21.8% reported a decrease in urine drug testing (Saloner et al. 2022).

MOUD providers reported they considered patients' stability when determining the amount of take-home methadone doses they prescribed (Hunter et al. 2021). Stability was defined by some providers as a lack of ongoing use of non-prescribed opioids and sedatives verified by urine drug testing (Levander, Pytell, et al. 2022). Providers also reported that extended take-home methadone reduced patients' burden in accessing medications and preventing COVID exposure while not increasing risk of overdose (Figgatt et al. 2021; Krawczyk et al. 2022). In fact, the percentage of overdose deaths involving methadone declined from 4.5% of overdose deaths in January 2019 to 3.2% by August 2021 (Jones et al. 2022).

Individuals who had housing reported that the increased flexibility of take-home dosing increased their freedom and safety from COVID; however, those that lack housing and other social supports felt that the adaptations worsened inequities for unhoused individuals (Harris et al. 2022). Both patients and providers noted increased patient autonomy, transparency, and treatment stability after receiving take-home dosing, with providers wanting to maintain flexibility in take-home policies (Suen et al. 2022). MOUD providers expressed a desire for the federal policies to continue with the ability to flexibly adjust take-home dosing (Treitler et al. 2022).

3.3.3 | Elimination of X-Waiver for Buprenorphine Prescribers

In one study 35.8% of providers agreed that removal of waiver training was a positive step to increasing access to buprenorphine (Lai et al. 2022). In a secondary analysis of quarterly DEA report for the second quarter of 2018 through the

fourth quarter of 2021 there was a mean quarterly growth of 100-patient waivers from 709 in the pre pandemic period to 1316 during the pandemic (Spetz et al. 2022). In a secondary analysis of one state's drug monitoring program although no increase in the overall number of individuals on MOUD, there was an increase in the mean days' supply prescribed (Chalasani et al. 2021). Examination of local health departments in 42 states found that there was a 10% (95% CI [5.7, 16.7]) increase in MOUD prescriptions dispensed (Swann et al. 2022).

3.3.4 | State Implementation of MOUD Policy Changes

Of the three studies that focused on state implementation of federal SUD policy changes, two were qualitative text analyses. Examination of 220 documents from the Social Security Administration policies related to SUD treatment revealed the major themes included changes related to infrastructure and operating procedures and technology for telehealth. Most of the policy changes involved facilitating telehealth, such as expanding insurance coverage and waiving facility licensure requirements (Andraka-Christou et al. 2021). State-level policies as of April 2020 (very early in the pandemic) from all 50 states were examined for support of federal treatment expansion. Twenty-seven of the fifty states enacted at least one of the policies; however, 24 states did not enact any of the policies. Fourteen states implemented extended take-home doses for MOUD, 12 implemented telehealth for schedule II-IV medications, and 10 states implemented telehealth for initiation of buprenorphine (Nesoff et al. 2022). The third study was a secondary analysis of government and nonprofit agencies from September 2020 to January 2021 and examined the adoption of COVID 19 policy changes. All states adopted at least 1 policy related to healthcare provider licensing permission by eliminating the x-waiver, but only 35 states expanded prescription authority to PAs and NPs (Pessar et al. 2021).

4 | Discussion

We had two aims in conducting this review, first to evaluate how OUD treatment policy changes impacted treatment access and second to specifically examine how the changes affected AI/AN communities. We found that patients and providers had generally positive views of OUD treatment policy changes that were enacted to maintain access to OUD treatment during the COVID-19 pandemic. Although the results of this review suggest that the multiple OUD treatment policy changes studied were beneficial in increasing access without an increase in overdose deaths thereby representing positive progress toward MOUD expansion, there remain many barriers to treatment. Because of the lack of inclusion and/or identification of AI/AN identity in the samples of the included studies, we unfortunately learned very little about how the policy changes affected the AI/AN communities. To meet the Healthy People 2023 objective of reducing overdose deaths (US Department of Health and Human Services 2020) a more comprehensive approach to OUD treatment is needed. Lack of MOUD education in health professional schools, stigmatisation of people who use drugs (PWUD), a payment system that focuses on acute care models rather than long-term treatment, and a resistance to incorporating MOUD treatment into regular health care have created barriers to care (Weimer et al. 2021).

The lack of broadband for telehealth services especially in rural areas in combination with having no MOUD providers within 30 miles of where many people live (Ali and Ghertner 2023) seriously limits access to treatment for these individuals. A third of AI/AN individuals live in rural or reservation areas with long travel distances and poor roads (Fortney et al. 2012), increasing their barriers to accessing MOUD. Social determinants of health that affect access to MOUD treatment for AI/AN individuals in rural areas and on reservations include poverty, inadequate health care resources due to chronic underfunding of the Indian Health Service and transportation issues due to poor road conditions (Kakol et al. 2021).

Many individuals couldn't benefit from the telehealth service policy changes in Arizona (Meyerson et al. 2022) because they were required to go into the clinic to use a computer to speak with providers (who were working offsite). This highlights that good policy does not always translate into changes in practice. Although providers did express concerns with completing intake assessments via telehealth (Henretty et al. 2021; Huskamp et al. 2021), there was no reported increase in overdose deaths (Krawczyk et al. 2022) with an increase in telehealth services.

Despite a relaxation of federal methadone maintenance treatment (MMT) regulations during COVID-19, many programs did not change their policies (Simon et al. 2022). Some clinics did not increase the number of take-home doses they gave patients, or only gave a few additional doses rather than the 14–28 that were allowed with the policy changes. The primary reason given for restricting methadone access was to decrease diversion and fatal overdose risk, neither of which ultimately increased among patients who were afforded the treatment flexibility (Figgatt et al. 2021). In fact, take-home dosing has been associated with increased retention in treatment and employment (King et al. 2006).

In a national study examining the availability and use of MOUD treatment among AI/AN individuals, facilities run by tribal governments and the Indian Health Service (IHS) found these facilities had the lowest use of MOUD (Krawczyk, Bunting, et al. 2021; Krawczyk, Garrett, et al. 2021). Tribal health systems reported discomfort with evidence-based substance use programs, believing that they were based on Western values and not compatible with tribal customs (Moullin et al. 2019). The lower uptake of MOUD in tribal health systems could also reflect the historical underfunding of tribal and IHS-run programs, creating a lack of resources to expand treatment services for OUD (Artiga et al. 2013).

Eliminating x-Waiver requirements for providers expands the pool of healthcare providers who can prescribe buprenorphine, potentially increasing access to the medication for individuals with OUD. A secondary analysis of the quarterly DEA report found that there was an increase in providers prescribing buprenorphine (Spetz et al. 2022), helping to address the opioid epidemic more effectively. Eliminating the waiver requirement could also reduce stigma and encourage more healthcare providers to become involved in addiction treatment.

Buprenorphine is an effective OUD treatment and integrating it into primary care settings can improve the coordination of care for PWUD. Eliminating x-waivers could facilitate this integration, making treatment more accessible and patient-centered (D'Onofrio et al. 2021).

4.1 | Increased Risks for the AI/AN Population

Our secondary aim was to investigate the inclusion of AI/AN individuals in these studies, considering they have been most affected by the OUD crisis. In fact, the AI/AN population have had the highest overdose rates from opioids in 2017 (15.6 deaths/100,000 population) among all racial/ethnic groups in the US (NCHS 2021). These rates increased after the onset of COVID-19. Among AI/AN men, those aged 25–44 years experienced the highest rates in 2020 (87.2%), and AI/AN women aged 25–44 years also had the largest relative increase in overdose death rate in 2020 (88%) (Kariisa et al. 2022). Despite this health disparity, only two of the 44 studies included in this review provided an option of identifying as an AI/AN individual, and these two studies reported $<4\%$ of the sample identified as AI/AN identity. Racial misclassification or missing racial data underreports this health disparity, impeding the development of effective public health policies to provide equitable care for AI/AN individuals.

4.2 | Additional Strategies

In addition to maintaining the policies that were initiated during COVID-19, harm reduction strategies are essential to reducing overdose mortality. These strategies focus on minimising the negative consequences of opioid use while recognising that abstinence may not be an immediately achievable goal for everyone (Cheung 2000). Some of these strategies include naloxone distribution and training, supervised injection facilities, syringe services programs, drug testing kits, public health campaigns to reduce stigma, good Samaritan laws that legally protect individuals who seek assistance for someone experiencing an overdose, supportive housing services, and policy changes.

Naloxone is a life-saving medication that reverses opioid overdose. Since 2018 the United States Office of the Surgeon General has been urging the community distribution of naloxone (Adams 2018). Widespread training on recognition of the signs of overdose and how to administer naloxone is an important public health initiative. Naloxone should be available to opioid users, their families, and first responders. Having naloxone available at community sites increases access for good Samaritans and decreases overdose mortality (Keane et al. 2018). The United States Food and Drug Administration (US FDA) recently approved the first over-the-counter naloxone nasal spray (US FDA 2023) but there remain barriers to obtaining naloxone even without needing a prescription. Barriers including high cost, availability in stores, and being required to ask a pharmacist may prevent PWUDs from accessing naloxone (Fortier et al. 2023).

Supervised consumption sites provide a safe and hygienic environment for individuals to use drugs with trained staff available. These sites have helped to decrease the spread of HIV and Hepatitis C and have decreased the risk of overdose death (Marshall et al. 2011). Needle exchange programs, also referred to as syringe service programs (SSP), provide clean needles and syringes to people who inject drugs, with a reduction in transmission of HIV and Hepatitis C.

SSPs need to be supported with evidence-based practices such as need-based syringe distribution (not requiring exchange of used syringes to get more), secondary exchange, and delivery models (Frost, Austin, et al. 2022; Frost, Sweek, et al. 2022). SSPs often include HIV and HCV testing and provision of initial and sustained access to OUD treatment. These programs also maintain connection with participants, which is particularly important for individuals who are unhoused. Providing funding for SSPs and community health centers is critical since these are access sites often preferred by PWUD. Not only providing SSPs but also increasing access to naloxone and fentanyl test strips is an important tool in preventing overdose deaths (Walters et al. 2020). Accessibility to drug testing kits to test the purity and contents of substances they plan to use helps users make informed decisions and reduce the risk of overdose due to unexpected contaminants.

Advocating for evidence-based policy changes, such as decriminalisation, sentencing reform, and diversion programs can reduce the risk of overdose and promote treatment over punishment (Incze et al. 2023). People with OUD confront the risk of arrest, injury, and death and need to be offered alternatives to incarceration. We should consider policies such as those enacted in Oregon and British Columbia, Canada that decriminalise possession of small amounts of illicit drugs. These policies, when paired with substantial investment in accessible community-based OUD treatment infrastructure and psychosocial supports, such as housing and peer support services, could both prevent incarceration and reduce re-entry risk (Incze et al. 2023).

Stable housing, employment opportunities, mental health services, and counselling can play a crucial role in reducing opioid-related harm (NIDA 2023). Addressing the social determinants of opioid use disorder can help individuals with their recovery. For example, homelessness increases the likelihood of infectious disease transmission (Galea and Vlahov 2002). Community outreach and peer support can provide individuals with OUD access to resources and treatment options. Peer support reduces isolation and can provide a sense of connectedness. Community engagement is critical to providing equitable MOUD treatment programs (SAMHSA 2022).

5 | Conclusion & Implications

The policy changes related to MOUD treatment have been shown to be beneficial; however, there is much more that needs to be implemented to affect this devastating health crisis. There are several specific nursing implications (See Table 3). MOUD clinics should implement the policy changes with extended hours, telehealth options, allow for the involvement of children, and not require lock boxes for take-home dosing especially for individuals who are homeless.

TABLE 3 | Nursing Implications Corresponding to Themes.

Theme	Finding	Recommendations	Nursing implications
Telehealth for Buprenorphine	Increased access to MOUD treatment through telehealth; however, rural areas face broadband limitations and disparities in technology access	Expand telehealth services to include comprehensive training for providers Advocate for improved broadband access in rural areas	Nurses should be trained in telehealth technology to facilitate remote assessment and follow-up Advocate for policies that enhance technology access for underserved populations
Increase in Take-Home Methadone Doses	Significant increase in take-home doses without adverse overdose outcomes	Continue to support and formalise policies that allow for increased take-home doses Monitor and evaluate the impact of these policies on patient outcomes	Nurses should educate patients on the safe use of take-home methadone and monitor adherence Participate in research to assess the effectiveness of take-home dosing
Elimination of X-Waiver for Buprenorphine Prescribers	Slight increase in the number of prescribers but no significant change in overall treatment coverage	Encourage states to adopt policies that support the elimination of barriers for prescribing buprenorphine	Nurses can play a role in advocating for policy changes and educating peers about the importance of removing barriers to treatment Engage in collaborative practice with prescribers and advanced practice nurses that can prescribe to improve access to care
State Implementation of OUD Treatment Policy Changes	Variability in state-level adoption of federal policies; some states enacted supportive policies while others did not	Promote uniformity in policy implementation across states to ensure equitable access to treatment	Nurses should participate in state-level advocacy efforts to push for consistent policy changes that support OUD treatment Engage in community education to raise awareness about available resources and services

It is clear from the high rates of AI/AN overdose deaths that funding for research and treatment that include within group interventions is needed. Ensuring access to MOUD treatment within AI/AN communities is crucial for improving outcomes for this population. The lack of ethnic identification in treatment intake and research is a longstanding issue with negative consequences, leading to a lack of accurate data on the unique needs, experiences, and challenges of these communities. This, in turn, can hinder the development of targeted interventions and policies. Failing to recognise the ethnic identities of biracial AI/AN individuals contributes to their invisibility and hinders the misallocation of resources, potentially impacting the health and social services available for AI/AN communities. To identify the AI/AN population, it will be important to allow reporting ethnicity as either AI/AN ethnicity only or with another ethnic group.

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The authors declare no conflicts of interest.

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Data sharing is not applicable to this article as no new data were created or analysed in this study.

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