

## Telehealth Use and Health Equity for Mental Health and Substance Use Disorder During the COVID-19 Pandemic: An Updated Systematic Review

J. Priyanka Vakkalanka, PhD;<sup>1-2</sup> Khyathi Gadag, BDS, MHA;<sup>3</sup> Lauren Lavin, BS;<sup>3</sup> Sara Ternes, MPH;<sup>1-2</sup> Heather S. Healy, MA, MLS;<sup>4</sup> Kimberly A. S Merchant, MA;<sup>3</sup> Marcia M. Ward, PhD;<sup>3</sup> Nicholas M Mohr, MD, MS<sup>1,2,5</sup>

<sup>1</sup> Department of Emergency Medicine, University of Iowa Carver College of Medicine, Iowa City, IA, USA, 52242

<sup>2</sup> Department of Epidemiology, University of Iowa College of Public Health, Iowa City, IA, 52242

<sup>3</sup> Department of Health Management and Policy, University of Iowa College of Public Health, Iowa City, IA, USA, 52242

<sup>4</sup> Hardin Library for the Health Sciences, University of Iowa, Iowa City, Iowa, Iowa City, IA, USA, 52242

<sup>5</sup> Department of Anesthesia Critical Care, Carver College of Medicine, University of Iowa, Iowa City, IA, USA, 52242

### Background

The onset of the COVID-19 public health emergency (PHE) reduced health care availability,<sup>1-4</sup> especially among those with underlying mental health conditions and substance use disorders (SUDs), a population already at greater risk for inadequate access to care and health disparities. To overcome this challenge, telehealth was rapidly integrated into healthcare to reduce disease transmission and address patient and provider safety. In 2023, we conducted a systematic review to understand how telehealth use contributed to health equity during the COVID-19 PHE for patients with mental health conditions and SUDs.<sup>5</sup> This brief updates our prior systematic review with new data.

### Methods

We used the search strategy and methods previously reported for our prior systematic review (PROSPERO CRD42022383956),<sup>6</sup> and all citations in this update were abstracted by a single reviewer. We conducted a search update in PubMed,<sup>7</sup> Embase,<sup>8</sup> Cochrane CENTRAL Register of Controlled Trials,<sup>9</sup> CINAHL,<sup>10</sup>

telehealth.hhs.gov,<sup>11</sup> and the Rural Health Research Gateway<sup>12</sup> on June 30, 2023, to find references published since the original search on November 9, 2022, using the concepts of telehealth, COVID-19, health equity, and clinical conditions of mental health and SUDs.

### Findings

Of the 581 references in our updated search, 20 met final inclusion criteria for the study, and most (n = 12) included quasi-experimental studies (before-and-after, difference-in-difference, or comparisons of longitudinal data in pre-COVID-19 vs. COVID-19 eras). Dimensions of equity that were captured included rural designations (n = 8), age (n = 17), gender (n = 17), race/ethnicity (n = 18), sexual orientation/identity (n = 1), insurance (n = 5), social vulnerability (n = 4). Trends identified in telehealth utilization were similar to those reported in our initial publication. Characteristics of mental health studies are presented in Table 1, while SUD-specific studies are presented in Table 2.

### Key Findings

- The number of studies evaluating the use of telehealth in patients with substance use disorder and alcohol use disorders has increased.
- Newer studies are examining clinical effectiveness of telehealth, though sub-group analyses are often not reported.
- Socially disadvantaged groups (e.g., gender and sexual minorities, economically disadvantaged groups) remain understudied.

**Table 1. Characteristics of Mental Health Studies and Findings by Sub-group**

Author, Year	Geographical and Clinical Settings	Study Design	Exposures	Outcome	Demographic Groups Assessed										
					Rural	Age		Female	Race/Ethnicity				Sexual Orientation/Identity	Insurance	Social Vulnerability
						Pediatric/Young Adult	Older Age		Black	Asian	Other	Hispanic			
<b>Mental Health</b>															
Capobianco, 2023 <sup>13</sup>	UK (Manchester City); Community	Quasi-experimental   Before-and-after	Remote therapy vs face-to-face treatment, Demographics	Remote vs In-person	---	---	---	---	---	---	---	---	---	---	---
Jones, 2022 <sup>14</sup>	US (Medicare)	Quasi-experimental   Longitudinal Cohorts	Demographics	Telehealth utilization	---	---	---	---	---	---	---	---	---	---	---
Kim, 2023 <sup>15</sup>	US (VHA); Single Site	Quasi-experimental   Before-and-after	Demographics	National: Telehealth utilization observed vs expected rates	---	---	---	---	---	---	---	---	---	---	---
				Puget Sound: Telehealth utilization observed vs expected rates	---	---	---	---	---	---	---	---	---	---	---
Kris, 2023 <sup>16</sup>	US (Michigan); Community mental health center	Quasi-experimental   Before-and-after	Telehealth Implementation	Attendance rates	---	---	---	---	---	---	---	---	---	---	---
Lin, 2023 <sup>17</sup>	US (General); Population-based representative sample	Cross-sectional	Demographics	Telemedicine utilization	---	---	---	---	---	---	---	---	---	---	---
O'Shea, 2023 <sup>18</sup>	US (VHA); National	Quasi-experimental   Before-and-after	Broadband speed level, Demographics	Broadband quality	---	---	---	---	---	---	---	---	---	---	---
Perez, 2023 <sup>19</sup>	US (California); University Outpatient Program	Retrospective observational cohort	Demographics	Number of Sessions (telehealth vs in-person)	---	---	---	---	---	---	---	---	---	---	---
Riley, 2022 <sup>20</sup>	US (Idaho); Department of Behavioral Services	Quasi-experimental   Before-and-after	Pre-COVID-19/COVID-19 pandemic cohort demographics	Comparison of COVID-19 telehealth cohort with pre-COVID-19 in-person	---	---	---	---	---	---	---	---	---	---	---
Stone, 2023 <sup>21</sup>	US (Massachusetts); University hospital outpatient, group-based treatment program	Quasi-experimental   Before-and-after	Demographics, Clinical Care Type	Differences between in person and telehealth groups	---	---	---	---	---	---	---	---	---	---	---
Toulany, 2023 <sup>22</sup>	Canada (Ontario); Population-based	Retrospective observational cohort	Demographics	Number of physician-based outpatient mental health-related visits	---	---	---	---	---	---	---	---	---	---	---
Walker, 2023 <sup>23</sup>	Canada (General); Veterans in the community	Cross-sectional	Demographics	Telemental health care use	---	---	---	---	---	---	---	---	---	---	---
<b>Decreased telehealth outcome in sub-group</b>				<b>No differences observed in sub-group comparisons</b>											
<b>Increased telehealth outcome in sub-group compared to majority</b>				<b>Only conducted within one sub-group (e.g., only within children, only among Medicare beneficiaries)</b>											
<b>Findings unclear</b>				<b>--- Sub-group analysis not performed</b>											

**Table 2. Characteristics of Substance Use Disorder Studies and Findings by Sub-group**

Author, Year	Geographical and Clinical Settings	Study Design	Exposures	Outcome	Demographic Groups Assessed										
					Rural	Age		Female	Race/Ethnicity				Sexual Orientation/Identity	Insurance	Social Vulnerability
						Pediatric/Young Adult	Older Age		Black	Asian	Other	Hispanic			
<b>Alcohol Use Disorder</b>															
Palzes, 2022 <sup>24</sup>	US (California); Kaiser Permanente Network	Quasi-experimental   Before-and-after	Pre-COVID-19/COVID-19 pandemic cohort demographics	Telehealth treatment initiation	---	---									
<b>Opioid Use Disorder</b>															
Bailey, 2023 <sup>25</sup>	US (Oregon); Two study clinics (Rural Health Clinic; Urban Federally Qualified Health Center)	Retrospective observational cohort	Demographics	Majority of OUD-related visits via telehealth versus in-person		---									
Hser, 2023 <sup>26</sup>	US (Maine, Washington, Idaho); Rural clinics	Intervention   Single arm, feasibility	Demographics	Telehealth referral at Baseline	---	---									
Jones, 2022 <sup>14</sup>	US (Medicare)	Quasi-experimental   Longitudinal Cohorts	Demographics	Telehealth utilization		---									
Livingston, 2022 <sup>27</sup>	US (VHA); National	Quasi-experimental   Longitudinal Cohorts	Pre-COVID-19/COVID-19 pandemic cohort demographics	Telehealth utilization		---									
Williams, 2023 <sup>28</sup>	US (New York, Pennsylvania); Online recruitment	Retrospective observational cohort	Demographics	Treatment retention - 180 days Treatment retention - 365 days		---									
<b>Substance Use Disorder</b>															
Deng, 2022 <sup>29</sup>	US (California); University Clinic	Quasi-experimental   Before-and-after	Pre-COVID-19/COVID-19 pandemic cohort demographics	Differences in patient characteristics in pre-pandemic and pandemic eras	---										
Gujral, 2023 <sup>30</sup>	US (VHA); National	Quasi-experimental   DID	Tablet implementation	Differences in patient characteristics between those who received tablets vs not		---									
Kennedy, 2022 <sup>31</sup>	US (California); Vulnerable, low income setting in LA County	Cross-sectional	Demographics	Characteristics of patients receiving telemedicine consults	---	---									
Sistad, 2023 <sup>32</sup>	US (VHA); Outpatient alcohol and drug treatment clinic	Quasi-experimental   Before-and-after	Remote therapy vs face-to-face treatment	Treatment modality Treatment initiation	---	---									
<b>Decreased telehealth outcome in sub-group</b>					<b>No differences observed in sub-group comparisons</b>										
<b>Increased telehealth outcome in sub-group compared to majority</b>					<b>Only conducted within one sub-group (e.g., only within children, only among Medicare beneficiaries)</b>										
<b>Findings unclear</b>					<b>--- Sub-group analysis not performed</b>										

## Discussion

Most results in this update of our systematic review were similar to our initial findings. Telehealth utilization was lower among disadvantaged groups, such as rural, older, and Black/African American populations. Social vulnerability dimensions, such as sexual orientation, regions with high area deprivation index, or economically disadvantaged groups, remained understudied across both search periods.

There were two key differences with our updated search. First, telehealth utilization was still the predominant outcome assessed in the updated search; however, more recent studies have examined short-term clinical secondary outcomes (e.g., anxiety scores,<sup>13, 14</sup> treatment retention,<sup>15-18</sup> readmission rates).<sup>19</sup> While telehealth utilization was commonly measured across by demographics and social determinants of health, sub-group-specific secondary clinical outcomes were seldom reported. Therefore, our understanding of clinical outcomes across disadvantaged populations remains incomplete. Second, our updated search included more studies investigating the role of telehealth in alcohol-use disorder and SUD broadly. Future work should examine findings of telehealth-related outcomes by providing both overall estimates that adjust for sociodemographic characteristics and independent associations between these factors and clinical outcomes.

In conclusion, our updated search demonstrated that social vulnerability remains a risk factor for low telehealth utilization. To further understand whether a digital divide is widening within disadvantaged groups, future research should incorporate dimensions of social health determinants and include more clinically relevant outcomes.

## Notes

1. Buikema AR, Buzinec P, Paudel ML, et al. Racial and ethnic disparity in clinical outcomes among patients with confirmed COVID-19 infection in a large US electronic health record database. *EClinicalMedicine*. 2021;39:101075. [10.1016/j.eclinm.2021.101075].
2. Magesh S, John D, Li WT, et al. Disparities in COVID-19 Outcomes by Race, Ethnicity, and Socioeconomic Status: A Systematic-Review and Meta-analysis. *JAMA Netw Open*. 2021;4(11):e2134147. [10.1001/jamanetworkopen.2021.34147].
3. Robinson-Lane SG, Sutton NR, Chubb H, et al. Race, Ethnicity, and 60-Day Outcomes After Hospitalization With COVID-19. *J Am Med Dir Assoc*. 2021;22(11):2245-50. [10.1016/j.jamda.2021.08.023].
4. Wang SM, Dalal K. Safe communities in China as a strategy for injury prevention and safety promotion programmes in the era of rapid economic growth. *J Community Health*. 2013;38(1):205-14. [10.1007/s10900-012-9594-4].
5. Vakkalanka JP, Gadag K, Lavin L, et al. Telehealth Use and Health Equity for Mental Health and Substance Use Disorder During the COVID-19 Pandemic: A Systematic Review. *Telemed J E Health*. 2024. [10.1089/tmj.2023.0588].
6. Vakkalanka JP, Mohr NM, Ward MM, et al. Telehealth applications for the management of mental health and substance use disorder on clinical and operational outcomes in rural settings and underserved communities during the COVID-19 pandemic. PROSPERO 2022 CRD42022383956. Available from: [https://www.crd.york.ac.uk/prospero/display\\_record.php?ID=CRD42022383956](https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42022383956). [Last Accessed: 2023.10.10].
7. Vakkalanka JP, Gadag K, Lavin L, et al. Telehealth use and health equity for mental health and substance use disorder during the COVID-19 pandemic: A systematic review (PUBMED). *SearchRXIV*. 2023. [10.1079/searchRxiv.2023.00412].
8. Vakkalanka JP, Gadag K, Lavin L, et al. Telehealth use and health equity for mental health and substance use disorder during the COVID-19 pandemic: A systematic review (EMBASE). *SearchRXIV*. 2023. [https://doi.org/10.1079/searchRxiv.2023.00407].

9. Vakkalanka JP, Gadag K, Lavin L, et al. Telehealth use and health equity for mental health and substance use disorder during the COVID-19 pandemic: A systematic review (Cochrane CENTRAL). SearchRXIV. 2023. [<https://doi.org/10.1079/searchRxiv.2023.00406>].
10. Vakkalanka JP, Gadag K, Lavin L, et al. Telehealth use and health equity for mental health and substance use disorder during the COVID-19 pandemic: A systematic review (CINAHL). SearchRXIV. 2023. [<https://doi.org/10.1079/searchRxiv.2023.00405>].
11. Health Resources & Services Administration. Telehealth.HHS.gov 2023. Available from: <https://telehealth.hhs.gov/>. [Last Accessed: 12/19/2023].
12. The Rural Health Research Gateway. Rural Health Research Gateway. Available from: <https://www.ruralhealthresearch.org/>. [Last Accessed: 12/19/2023].
13. Capobianco L, Verbist I, Heal C, et al. Improving access to psychological therapies: Analysis of effects associated with remote provision during COVID-19. *British Journal of Clinical Psychology*. 2023;62(1):312-24. [doi:10.1111/bjc.12410].
14. Jones CM, Shoff C, Hodges K, et al. Receipt of Telehealth Services, Receipt and Retention of Medications for Opioid Use Disorder, and Medically Treated Overdose Among Medicare Beneficiaries Before and During the COVID-19 Pandemic. *JAMA Psychiatry*. 2022;79(10):981-92. [10.1001/jamapsychiatry.2022.2284].
15. Kim JM, McCann RA, Gold SD, et al. Racial and ethnic disparities in telemental health usage among veterans. *Psychol Serv*. 2023. [doi:10.1037/ser0000770].
16. Kris J. Telehealth Implementation, Treatment Attendance, and Socioeconomic Disparities in Treatment Utilization in a Community Mental Health Setting During the COVID-19 Pandemic: A Retrospective Analysis of Electronic Health Record Data. *Telemed Rep*. 2023;4(1):55-60. [doi:10.1089/tmr.2022.0005].
17. Lin C, Pham H, Hser YI. Mental Health Service Utilization and Disparities in the U.S: Observation of the First Year into the COVID Pandemic. *Community Ment Health J*. 2023;59(5):972-85. [doi:10.1007/s10597-022-01081-y].
18. O'Shea AMJ, Howren MB, Mulligan K, et al. Quantifying the Digital Divide: Associations of Broadband Internet with Tele-mental Health Access Before and During the COVID-19 Pandemic. *J Gen Intern Med*. 2023. [doi:10.1007/s11606-023-08120-8].
19. Perez V, Ruderman M, Kussman M, et al. Mental health engagement among foster and adopted youth: the transition from in-person to telemental health services. *Social Work in Mental Health*. 2023;21(2):203-21. [doi:10.1080/15332985.2022.2123728].
20. Riley EN, Cordell KD, Shimshock SM, et al. Evaluation of Telehealth in Child Behavioral Health Services Delivery During the COVID-19 Pandemic. *Psychiatr Serv*. 2022:appips20220141. [doi:10.1176/appi.ps.20220141].
21. Gittins Stone DI, Elkins RM, Gardner M, et al. Examining the Effectiveness of an Intensive Telemental Health Treatment for Pediatric Anxiety and OCD During the COVID-19 Pandemic and Pediatric Mental Health Crisis. *Child psychiatry and human development*. 2023. [doi:10.1007/s10578-023-01500-5].
22. Toulany A, Kurdyak P, Stukel TA, et al. Sociodemographic Differences in Physician-Based Mental Health and Virtual Care Utilization and Uptake of Virtual Care Among Children and Adolescents During the COVID-19 Pandemic in Ontario, Canada: A Population-Based Study. *Can J Psychiatry*. 2023;7:06744E+15. [doi:10.1177/07067437231156254].
23. Walker DL, Nouri MS, Plouffe RA, et al. Telehealth experiences in Canadian veterans: associations, strengths and barriers to care during the COVID-19 pandemic. *BMJ Mil Health*. 2023. [doi:10.1136/military-2022-002249].
24. Palzes VA, Chi FW, Metz VE, et al. COVID-19 pandemic-related changes in utilization of telehealth and treatment overall for alcohol use problems. *Alcohol Clin Exp Res*. 2022;46(12):2280-91. [doi:10.1111/acer.14961].
25. Bailey SR, Wyte-Lake T, Lucas JA, et al. Use of Telehealth for Opioid Use Disorder Treatment in Safety Net Primary Care Settings: A Mixed-Methods Study. *Subst Use Misuse*. 2023;58(9):1143-51. [doi:10.1080/10826084.2023.2212378].

26. Hser YI, Mooney LJ, Baldwin LM, et al. Care coordination between rural primary care and telemedicine to expand medication treatment for opioid use disorder: Results from a single-arm, multisite feasibility study. *J Rural Health*. 2023. [doi:10.1111/jrh.12760].
27. Livingston NA, Davenport M, Head M, et al. The impact of COVID-19 and rapid policy exemptions expanding on access to medication for opioid use disorder (MOUD): A nationwide Veterans Health Administration cohort study. *Drug Alcohol Depend*. 2022;241:109678. [doi:10.1016/j.drugaldep.2022.109678].
28. Williams AR, Aronowitz SV, Rowe C, et al. Telehealth for opioid use disorder: retention as a function of demographics and rurality. *Am J Drug Alcohol Abuse*. 2023;49(2):260-5. [doi:10.1080/00952990.2023.2180382].
29. Deng H, Raheemullah A, Fenno LE, et al. A telehealth inpatient addiction consult service is both feasible and effective in reducing readmission rates. *J Addict Dis*. 2022;8-Jan. [doi:10.1080/10550887.2022.2090822].
30. Gujral K, Van Campen J, Jacobs J, et al. Impact of VA's video telehealth tablets on substance use disorder care during the COVID-19 pandemic. *J Subst Use Addict Treat*. 2023;150:209067. [doi:10.1016/j.josat.2023.209067].
31. Kennedy AJ, George JS, Rossetti G, et al. Providing Low-barrier Addiction Treatment Via a Telemedicine Consultation Service During the COVID-19 Pandemic in Los Angeles, County: An Assessment 1 Year Later. *Journal of addiction medicine*. 2022. [doi:10.1097/ADM.0000000000001034].
32. Sistad RE, Enggasser J, Livingston NA, et al. Comparing substance use treatment initiation and retention between telehealth delivered during COVID-19 and in-person treatment pre-COVID-19. *Am J Addict*. 2023;32(3):301-8. [doi:10.1111/ajad.13385].

*This study was supported by the Office for the Advancement of Telehealth (OAT), Health Resources and Services Administration (HRSA), U.S. Department of Health and Human Services (HHS) under Cooperative Agreement U3GRH40003. The information and conclusions in this brief are those of the authors and no inferred endorsement by OAT, HRSA, or HHS.*