Use of Video Telehealth Tablets to Increase Access for Veterans Experiencing Homelessness

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BACKGROUND: Veterans experiencing homelessness face substantial barriers to accessing health and social services. In 2016, the Veterans Affairs (VA) healthcare system launched a unique program to distribute video-enabled tablets to Veterans with access barriers. OBJECTIVE: Evaluate the use of VA-issued video telehealth tablets among Veterans experiencing homelessness in the VA system. DESIGN: Guided by the RE-AIM framework, we first evaluated the adoption of tablets among Veterans experiencing homelessness and housed Veterans. We then analyzed health record and tablet utilization data to compare characteristics of both subpopulations, and used multivariable logistic regression to identify factors associated with tablet use among Veterans experiencing homelessness. PATIENTS: In total, 12,148 VA patients receiving tablets between October 2017 and March 2019, focusing on the 1470 VA Veterans experiencing homelessness receiving tablets (12.1%). MAIN MEASURES: Tablet use within 6 months of receipt for mental health, primary or specialty care. KEY RESULTS: Nearly half (45.9%) of Veterans experiencing homelessness who received a tablet had a video visit within 6 months of receipt, most frequently for temental health. Tablet use was more common among Veterans experiencing homelessness who were younger (AOR = 2.77; P < .001); middle-aged (AOR = 2.28; P < .001); in rural settings (AOR = 1.46; P =.005); and those with post-traumatic stress disorder (AOR = 1.64; P < .001), and less common among those who were Black (AOR = 0.59; P <.001) and those with a substance use disorder (AOR = 0.59; P < .001) or persistent housing instability (AOR = 0.75; P = .023). CONCLUSIONS: Telehealth care and connection for vulnerable populations are particularly salient during the COVID-19 pandemic but also beyond. VA’s distribution of video telehealth tablets offers healthcare access to Veterans experiencing homelessness; however, barriers remain for subpopulations. Tailored training and support for these patients may be needed to optimize telehealth tablet use and effectiveness.

KEY WORDS: homelessness; Veterans; telemedicine; health services accessibility; mental health.

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The US Department of Veterans Affairs (VA) is a leader in clinical video telehealth to increase Veterans’ access to high-quality care.1 In 2018 alone, VA healthcare systems provided more than 2.29 million telehealth episodes of video telehealth care to 12% of eligible Veterans.2 The VA Video Connect (VVC) mobile application allows Veterans to securely stream live video sessions with their healthcare teams on the device of their choice.

Studies have shown that video telehealth can offer effective delivery of mental healthcare,3–5 primary care,6,7 and specialty ambulatory care.8–10 Patient populations who face sociodemographic and clinical challenges (e.g., travel distance to care for rural patients) can benefit from video telehealth.11–16 Other vulnerable populations that have been shown to benefit from video telehealth include older adults,17–21 African American and Hispanic adults,22–25 and Native and Alaskan American adults,26,27 and patients with mental health conditions such as anxiety and depression28 or anxiety and alcohol use disorder,29,30 post-traumatic stress disorder (PTSD),31,32 substance use disorder (SUD),33–35 or challenges with medication adherence.36

One VA patient population that could potentially benefit from virtual care is Veterans experiencing homelessness, representing 8% (n=37,085) of all US homeless adults. This population is a VA priority in part because it is characterized by elevated mortality due to high rates of suicide and fatal overdoses.37,38 Veterans experiencing homelessness...
encounter health- and travel-related access barriers, while stigma may interfere with their willingness to seek care. Video telehealth could overcome some of these challenges, offering a mechanism for improved access to critical clinical services in this population.39,40

Little is known about video telehealth use among Veterans experiencing homelessness and how this technology influences their access to care. In 2016, the VA began the largest known program to distribute video telehealth tablets to Veterans facing access barriers. The tablets come with data plans and Wi-Fi connectivity.41 Between October 2017 and March 2019, the VA distributed 12,148 tablets to access-challenged Veterans. Tablets can be used for any clinical care that does not require physical contact, including mental health therapy and medication management, primary care, palliative care, and selective specialty and rehabilitation care.42

Previous evaluations have shown that the tablet distribution program successfully reached patients with clinical or social barriers and generated cost savings for such patients.43,44 In this study, we sought to examine variation in sociodemographic and clinical characteristics with tablet recipients stratified by housed vs. homeless status, and by tablet users vs. non-users among Veterans experiencing homelessness, and factors associated with their tablet use. Our findings may contribute to an understanding of how video telehealth tablets and other devices can substitute for in-person healthcare encounters in the context of the COVID-19 pandemic and beyond.

**METHODS**

**Tablet Distribution Evaluation**

This paper uses the RE-AIM framework to focus on the construct of adoption, “the level of patients’ acceptance, use of, satisfaction with, and willingness to recommend to others,” in this case, rates and characteristics of tablet use.45,46 The tablets were purchased by VA’s Office of Rural Health (ORH) from BL Healthcare, preconfigured to be compatible with VA Office of Information and Technology requirements including encryption. Eligibility criteria included enrolled and active VA patients, not having their own device or data plan, able to operate the technology (or have a caregiver assist), and unable to access in-person VA care. Eligible patients were referred by VA providers. Patient training involved VA representatives calling tablet recipients to guide them through initial system set-up. Providers received user training on Cisco Jabber video technology to connect with patients.43,44 Homeless tablet recipients who had at least one video visit in 6 months after receipt were considered “tablet users.”

This evaluation was conducted in partnership with the VA’s Office of Connected Care and the Virtual Access Quality Enhancement Research Initiative at VA Palo Alto, and was designated as non-research quality improvement by the Research and Development Committee of the VA Boston Healthcare System.

**Data Sources**

Data were drawn from VA’s Denver Acquisitions and Logistics Center (tablet shipment information) and VA’s national Central Data Warehouse (patient sociodemographic and clinical characteristics, in-person, and video clinical encounters).

**Measures**

Patient sociodemographics and clinical characteristics included age, sex, race/ethnicity, marital status, and rural/urban status. Rural and urban status was determined by ORH following the Rural-Urban Community Areas (RUCA) system used by the US Census Bureau.47 Patient characteristics also included VA Enrollment Priority Group which incorporates a Veteran’s military service history, service-connected disability, income, Medicaid qualification, and receipt of other VA benefits.48 Priority Group 1 represents Veterans with service-connected disabilities; Priority Group 5 represents Veterans with low income.

Clinical diagnoses spanned 28 chronic physical health conditions and 4 mental health conditions—depression, PTSD, SUD, and serious mental illness (SMI)—and were identified using outpatient visits from the 12 months prior to tablet receipt. Clinical encounters included the type of clinic where tablets were used during the 6 months after tablet receipt: primary care, mental healthcare, specialty or other care. Indication of high risk for suicide was obtained from a VA clinical reminder from the year prior to tablet receipt. We included any in-person utilization of outpatient care and the number of in-person outpatient visits for mental health, primary care, and specialty care within 6 months of tablet receipt.

The sample included Veterans who had an indication of homelessness and had received a tablet. Homelessness was identified through the use of US Centers for Disease Control and Prevention diagnosis codes and VA Decision Support System (DSS) Identifiers.49,50 (Table 1 provides code descriptions and classification). Our measure of homelessness 6 months after tablet receipt was based on these same codes. Adoption (tablet use) was determined by a Veteran having a documented outpatient clinical video encounter within 6 months of tablet receipt (DSS code 179, for Clinical Video Telehealth into the Home). Similar adoption measures have been used in studies of patient-facing technologies such as secure messaging, telehealth, and video telehealth.6 We assessed whether recipients received more than one device.

**Data Analyses**

Our analyses addressed five objectives: First, we examined tablet distribution among Veterans by housing status (housed vs. homeless). We calculated the proportion of Veterans experiencing homelessness among total tablet recipients. We
used chi-square tests to examine the differences in demographic, social, and clinical characteristics between housed and homeless tablet recipients, then compared on urban vs. rural location among Veterans experiencing homelessness. We also examined healthcare utilization by tablet recipients, specifically the proportion of video versus in-person visits. Second, using chi-square tests, we compared tablet users versus non-users, initially among all Veterans experiencing homelessness, and for our third objective, we further stratified by urban and rural location. Fourth, we compared VA tablet utilization (completed video visits) in terms of proportion of each of 3 types of care (mental health, primary care, and specialty or other care) by housing status, and then further stratified by urban vs. rural location. Finally, we evaluated characteristics associated with tablet use through multivariable logistic regression. All bivariate analyses and regressions used a P-value ≤0.05 as the cutoff for significance. We used complete case analysis and missing values were noted in the descriptive tables.

**RESULTS**

**Tablet Recipient Characteristics**

From October 2017 to March 2019, 12,148 Veterans from 70 VA facilities across the USA received a tablet. Of these, 474 (3.9%) Veterans received more than one tablet. Veterans experiencing homelessness represented 12.1% \( (N = 1470) \) of all tablet recipients; homeless and housed tablet recipients varied across many sociodemographic and clinical characteristics, and in-person healthcare utilization (Table 2).

**Tablet User Characteristics and Utilization Patterns**

Nearly half (45.9%, \( N = 675 \)) of homeless recipients had used the tablet (“tablet users”) for a video visit within 6 months of receipt (Table 3). In bivariate analyses, homeless tablet users were more likely than non-users to be younger (35.7% vs. 23.9% in the 18–44 age range), married (24.7% vs. 17.5%), White (60.7% vs. 43.6%), residing in a rural location (34.9% vs. 21.2%), and required to drive ≥60 min to a VA facility (33.6% vs. 21.5%) (all results reported have P-values of <0.001 unless otherwise specified). Homeless tablet users were more likely to be in VA Priority Group 1 indicating a service-connected disability (37.8% vs. 30.0%; \( P = .002 \)) and to have PTSD (57.9% vs. 44.0%). Homeless tablet users were less likely to be middle-aged (57.5% vs. 62.5%) or older (6.8% vs. 13.6%), to be Black (26.2% vs. 46.3%), or to be homeless 6 months after tablet receipt (56.1% vs. 66.4%). They were also less likely to have 3 or more chronic conditions (48.7% vs. 56.7%; \( P = .006 \)) or to have SUD (47.6% vs. 58.2%).

Characteristics associated with tablet use differed across urban and rural Veterans experiencing homelessness (Table 4). Among these, rural tablet users (compared to rural non-users) were more likely to be younger (38.4% vs. 29.1%) and no longer homeless 6 months after tablet receipt (51.3% vs. 41.2%; \( P = .047 \)), were less likely to have ≥3 chronic conditions (47.0 vs. 62.4%; \( P = .008 \)) or SUD diagnoses (48.7% vs. 60.2%; \( P = .014 \)), but more likely to have PTSD (58.6% vs. 47.3%; \( P = .025 \)). Urban homeless tablet users (compared to urban non-users) were more likely to be married (22.7% vs. 15.5%; \( P = .004 \)) and either White (53.9% vs. 35.1%) or Hispanic (6.8% vs. 4.7%). Urban homeless tablet users were also more likely to be in Priority Group 1 indicating a service-connected disability (38.4% vs. 29.2%; \( P = .005 \)).

Table 5 shows that telehealth utilization for different types of care differed by housing status. Veterans experiencing homelessness were more likely to use video visits for mental health (88.0% vs. 72.1%), but less likely to use them for primary care (5.0% vs. 9.4%) and specialty or other care (12.0% vs. 23.6%). On average, Veterans experiencing homelessness had similar rates of mental health video visits as
housed Veterans, but fewer primary care and specialty care visits. Rural Veterans experiencing homelessness were more likely to use video visits for mental healthcare (94.8% vs. 84.1%) while urban counterparts were more likely to use video visits for primary care (6.9% vs. 1.7%; \( P = .004 \)). No difference was observed between rural and urban Veterans regarding mean mental health visits.

**Factors Predicting Tablet Use**

In multivariable analyses (Table 6), Veterans experiencing homelessness were more likely to have used their tablets if they were either younger (AOR = 2.77, 95% CI = 1.76, 4.35) or middle-aged (AOR = 2.28, 95% CI = 1.52, 3.43), and resided in a rural location (AOR = 1.46, 95% CI = 1.12, 1.90), while they were less likely to have video visits if they were Black (AOR = 0.43, 95% CI = 0.34, 0.56) or if they experienced persistent homelessness 6 months after tablet receipt (AOR = 0.75, CI = 95% 0.59, 0.96) (\( P = 0.023 \)). Having PTSD was associated with greater odds of tablet use (AOR = 1.64, 95% CI = 1.27, 2.12), while having SUD was associated with lower odds of tablet use (AOR = 0.59, 95% CI = 0.46, 0.76).

There were few differences in regression results in tablet use when stratified by urban/rural status. The exception is that among urban Veterans experiencing homelessness, Blacks, compared to Whites, were less likely to have video visits (AOR = 0.38; 95% CI = 0.29, 0.51), and urban Veterans experiencing homelessness with PTSD were more likely to have video visits than those without PTSD (AOR = 1.69; 95% CI = 1.46, 1.90).

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For housed Veterans and Veterans experiencing homelessness: missing values exist in marital status (223), race/ethnicity (435), enrollment priority group (118), geographic location (156). For urban and rural homeless tablet recipients: missing values exist in marital status (29), race/ethnicity (44), enrollment priority group (6). *All P-values for continuous variables derive from t-tests and P-values for categorical variables derive from chi-square tests. **Six (6) months after tablet receipt. *Unlike other variables in this table for which the unit is individual Veteran, for this variable, the unit is healthcare visits.
Table 3 Characteristics and Bivariate Comparisons (Unadjusted) of Telehealth Tablet Non-users vs. Users Among Veterans Experiencing Homelessness

|                  | All homeless tablet non-users N=795 (%) | All homeless tablet users N=675 (%) | P-value* |
|------------------|-----------------------------------------|------------------------------------|----------|
| Age              |                                         |                                    | <0.001   |
| 18–44            | 190 (23.9)                              | 241 (35.7)                         |          |
| 45–64            | 497 (62.5)                              | 388 (57.5)                         |          |
| 65+              | 108 (13.6)                              | 46 (6.8)                           |          |
| Gender           |                                         |                                    | 0.220    |
| Female           | 166 (20.9)                              | 159 (23.6)                         |          |
| Male             | 629 (79.1)                              | 516 (76.4)                         |          |
| Marital status   |                                         |                                    | <0.001   |
| Other            | 641 (82.5)                              | 500 (75.3)                         |          |
| Married          | 136 (17.5)                              | 164 (24.7)                         |          |
| Race/ethnicity   |                                         |                                    | <0.001   |
| White, non-Hispanic | 336 (43.6)                       | 396 (58.0)                         |          |
| Black, non-Hispanic | 357 (46.3)                       | 171 (26.2)                         |          |
| Hispanic         | 36 (4.7)                                | 33 (5.1)                           |          |
| Other            | 42 (5.4)                                | 52 (8.0)                           |          |
| Rural/urban location |                                  |                                    | <0.001   |
| Rural            | 165 (21.2)                              | 232 (34.9)                         |          |
| Urban            | 615 (78.8)                              | 431 (65.1)                         |          |
| Homelessness after 6 months |                    |                                    | <0.001   |
| No               | 267 (33.6)                              | 296 (43.9)                         |          |
| Yes              | 528 (66.4)                              | 379 (56.1)                         |          |
| Priority group   |                                         |                                    | 0.002    |
| Group 1: service-connected disabilities | 235 (30.0)                        | 253 (37.8)                         |          |
| Group 5: financial insecurity | 329 (42.0)                        | 229 (34.2)                         |          |
| Other than Groups 1 and 5 |                             |                                    |          |
| Chronic conditions (from list of 28) |                               |                                    | 0.006    |
| Zero             | 72 (9.1)                                | 82 (12.1)                          |          |
| 1 to 2           | 272 (34.2)                              | 264 (39.1)                         |          |
| 3 or more        | 451 (56.7)                              | 329 (48.7)                         |          |
| MH diagnoses     | 691 (86.9)                              | 622 (92.1)                         | 0.001    |
| Serious mental illness |                              |                                    | 0.140    |
| Post-traumatic stress disorder | 350 (44.0)                        | 391 (57.9)                         | <0.001   |
| Substance use disorder | 463 (58.2)                        | 321 (47.6)                         | <0.001   |
| Depression       | 554 (69.7)                              | 478 (70.8)                         | 0.640    |
| Suicide risk flag | 724 (91.1)                              | 616 (91.3)                         | 0.900    |
| No               | 72 (9.1)                                | 59 (8.9)                           |          |
| Yes              | 71 (8.9)                                | 59 (8.9)                           |          |

*All P-values derive from chi-square tests comparing tablet users and non-users

CI = 1.25, 2.29). In contrast, among rural Veterans experiencing homelessness, there was no variation in tablet use for video visits by race or PTSD diagnosis.

DISCUSSION

The VA’s recent tablet distribution initiative represents the largest nationwide program to provide video-enabled tablets to patients with access barriers. While this offers many patients the technology to participate in video telehealth visits, our findings suggest that a digital divide persists, where homeless recipients are less likely to use the tablets compared with housed counterparts. The low rate (<4%) of Veterans receiving a second tablet suggests that equipment loss/replacement was not a substantial factor in explaining our findings.

Furthermore, among homeless recipients, a number of factors were associated with lower tablet use, including older age, Black race, urban location, and a substance use disorder. These factors are discussed in the paragraphs below. Findings suggest a need for targeted interventions to support patients experiencing homelessness and might benefit from telemedicine.

Older age may be associated with lower tablet use due to increased barriers to technology use, including physical, cognitive, and motivational challenges. Additionally, the combination of aging with mental health conditions, such as PTSD, can make mental and physical health symptoms (e.g., return of traumatic memories) more inhibitive to trying novel technologies. The experience of homelessness is associated with more rapid physiological aging, suggesting these barriers may be even more pronounced in this population.

Older individuals’ adoption of technology may also relate to expectations of in-person social contact. Thus, new digital healthcare communications, such as video visits, may be more appealing as supplements, not substitutes, for in-person care. A study of older Veterans suggests they would benefit from simplified computer application designs and digital literacy training to increase comfort, confidence, and willingness to use.

People of color frequently face disparities in access to healthcare. In our study, Black Veterans experiencing homelessness represented 37% of tablet recipients, but only 26% of tablet users. Our analyses are consistent with recent research showing that Black Veterans, compared to White Veterans, are less likely to use VA’s My HealtheVet patient portal and clinical video telehealth. Implicit bias on the part of healthcare workers and structural racism in the healthcare system may also contribute to the disparities seen. Additionally, as a result, Black patients’ lower levels of trust in health professionals, compared to White patients, could potentially dampen interest in sharing personal health information via VA video visits. Recent work suggests that cultural tailoring of recruitment materials and outreach approaches can generate more interest in virtual healthcare among specific racial and/or ethnic groups.

Our finding that SUD was associated with reduced likelihood of video visits is consistent with other research indicating that patients actively using substances can have difficulty keeping video appointments and concentrating during visits, and express lower interest in interacting with healthcare providers by video. Yet telehealth holds promise for Veterans with SUD. A systematic review examined the use of mobile health interventions for the prevention of alcohol and substance use, finding that such interventions were feasible and effective. A recent study of VA tablets found that many Veterans with SUD prefer video visits to in-person visits.

Two characteristics were positively associated with tablet use among Veterans experiencing homelessness: a PTSD
Our study has a number of limitations. Our findings focused on Veterans within the VA system and on a single technology, so may not be generalizable to other populations and technologies. The tablet use examination period was short—6 months after receipt—so differences identified may have attenuated at Table 4. This is consistent with recent research which showed that although rural Veterans had 17% lower odds of MHV patient portal use compared with urban patients, they were substantially more likely than their urban counterparts to engage in Clinical Video Telehealth or dual use of these resources.55 This may be because rural Veterans often live at a distance from VA medical centers, and that the cost of driving to in-person visits (e.g., in time, transportation, lost wages) can be considerable.

| Characteristics and Bivariate Comparisons (Unadjusted) Between Telehealth Tablet Users vs. Non-users Among Veterans Experiencing Homelessness, Stratified by Urban/Rural Location |
|---------------------------------|---------------------------------|---------------------------------|---------------------------------|
| Urban homeless tablet non-users | Urban homeless tablet users     | P-value*                        | Rural homeless tablet non-users | Rural homeless tablet users     | P-value*                        |
| Age (years)                     | N=615 (%)                       | N=433 (%)                       | N=165 (%)                      | N=232 (%)                      |                                 |
| 18–44                           | 134 (21.8)                      | 148 (34.2)                      | <0.001                         | 48 (29.1)                      | 89 (38.4)                      | <0.001                         |
| 45–64                           | 404 (65.7)                      | 253 (58.4)                      | 87 (52.7)                      | 129 (55.6)                     |                                 |
| 65+                             | 77 (12.5)                       | 32 (7.4)                        | 30 (18.2)                      | 14 (6.0)                       |                                 |
| Gender                          |                                 |                                 |                                |                                |                                 |
| Female                          | 138 (22.4)                      | 107 (24.7)                      | 25 (15.2)                      | 48 (20.7)                      | 0.160                          |
| Male                            | 477 (77.6)                      | 326 (75.3)                      | 140 (84.8)                     | 184 (79.3)                     |                                 |
| Marital status                  |                                 |                                 |                                |                                |                                 |
| Other                           | 506 (84.5)                      | 327 (77.3)                      | 120 (73.6)                     | 166 (71.9)                     | 0.700                          |
| Married                         | 93 (15.5)                       | 96 (22.7)                       | 43 (26.4)                      | 65 (28.1)                      |                                 |
| Race/ethnicity                  |                                 |                                 |                                |                                |                                 |
| White, non-Hispanic             | 209 (35.1)                      | 223 (53.9)                      | 121 (74.2)                     | 169 (73.8)                     | 0.260                          |
| Black, non-Hispanic             | 329 (55.3)                      | 141 (34.1)                      | 23 (14.1)                      | 27 (11.8)                      |                                 |
| Hispanic                        | 28 (4.7)                        | 28 (6.8)                        | 7 (4.3)                        | 5 (2.2)                        |                                 |
| Other                           | 29 (4.9)                        | 22 (5.3)                        | 12 (7.4)                       | 28 (12.2)                      |                                 |
| Homelessness after 6 months     |                                 |                                 |                                |                                |                                 |
| No                              | 192 (31.2)                      | 174 (40.2)                      | 68 (41.2)                      | 119 (51.3)                     | 0.047                          |
| Yes                             | 423 (68.8)                      | 259 (59.8)                      | 97 (58.8)                      | 113 (48.7)                     |                                 |
| Priority group                  |                                 |                                 |                                |                                |                                 |
| Group 1: service-connected disabilities | 179 (29.2) | 166 (38.4) | 56 (34.1) | 87 (37.7) | 0.260 |
| Group 5: financial insecurity   | 256 (41.8)                      | 148(34.3)                       | 67 (40.9)                      | 76 (32.9)                      |                                 |
| Other than Groups 1 and 5       | 177(28.9)                       | 118 (27.3)                      | 41 (25.0)                      | 68 (29.4)                      |                                 |
| Chronic conditions (from list of 28) |                                 |                                 |                                |                                |                                 |
| Zero                            | 50 (8.1)                        | 47 (10.9)                       | 13 (7.9)                       | 31 (13.4)                      | 0.008                          |
| 1 to 2                          | 220 (35.8)                      | 167 (38.6)                      | 49 (29.7)                      | 92 (39.7)                      |                                 |
| 3 or more                       | 345 (56.1)                      | 219 (50.6)                      | 103 (62.4)                     | 109 (47.0)                     |                                 |
| MH diagnoses                    | 534 (86.8)                      | 397 (91.7)                      | 130 (90.9)                     | 215 (92.7)                     | 0.520                          |
| Serious mental illness          | 122 (19.8)                      | 97 (22.4)                       | 38 (23.0)                      | 61 (26.3)                      | 0.460                          |
| Post-traumatic stress disorder  | 269 (43.7)                      | 247 (57.0)                      | <0.001                         | 78 (47.3)                      | 136 (58.6)                     | 0.025                          |
| Substance use disorder          | 357 (58.0)                      | 204 (47.1)                      | <0.001                         | 101 (60.2)                     | 113 (48.7)                     | 0.014                          |
| Depression                      | 433 (70.4)                      | 304 (70.2)                      | 0.940                          | 118 (71.5)                     | 167 (72.0)                     | 0.920                          |
| Suicide risk flag               | 565 (91.9)                      | 400 (92.4)                      | 0.760                          | 145 (87.9)                     | 206 (88.8)                     | 0.780                          |
| No                              | 50 (8.1)                        | 33 (7.6)                        | 20 (12.1)                      | 26 (11.2)                      |                                 |

*All P-values derive from chi-square tests comparing tablet users and non-users.
Table 5 Telehealth Tablet Utilization, as Measured by VA Video Connect Visits—Comparisons (Unadjusted) Between Housed and Homeless Tablet Users, and Homeless Tablet Users Stratified by Urban/Rural Location

|                            | Housed tablet users | Homeless tablet users | P-value | Urban homeless tablet users | P-value | Rural homeless tablet users | P-value |
|-----------------------------|---------------------|-----------------------|---------|-----------------------------|---------|-----------------------------|---------|
|                            | N=6133              | N=675                 |         | N=433                       |         | N=232                       |         |
| Mental health visits, N (%)| 4425 (72.1)         | 594 (88.0)            | <0.001  | 364 (84.1)                  |         | 220 (94.8)                  | <0.001  |
| Mean (SD)                  | 3.6 (4.4)           | 3.9 (4.3)             | 0.098   | 3.8 (4.4)                   |         | 4.0 (4.1)                   | 0.49    |
| Primary care               | 574(9.4)            | 34 (5.0)              | <0.001  | 30 (6.9)                    |         | 4 (1.7)                     | 0.004   |
| Mean (SD) 574 (9.4)        | 0.2 (0.7)           | 0.1 (0.4)             | 0.003   | 0.1 (0.5)                   |         | 0 (0.2)                     | 0.005   |
| Specialty care visits, N (%)| 1449 (23.6)         | 81 (12.0)             | <0.001  | 59 (13.6)                   |         | 22 (9.5)                    | 0.12    |
| Mean (SD)                  | 1.0 (2.8)           | 0.3 (1.1)             | <0.001  | 0.3 (1.1)                   |         | 0.3 (1.2)                   | 0.67    |

10 Veterans missing rural and urban information. *All P-values for continuous variables derive from t-test and P-values for categorical variables derived from chi-square tests. SD standard deviation

Table 6 Logistic Regression: Predicting Telehealth Tablet Use Among Veterans Experiencing Homelessness, and Stratified by Urban/Rural Location

|                            | All homeless tablet users (N = 1395) | Urban homeless tablet users (N = 1005) | Rural homeless tablet users (N = 390) |
|-----------------------------|--------------------------------------|----------------------------------------|---------------------------------------|
|                            | Odds ratio (95% CI) | P-value* | Odds ratio (95% CI) | P-value* | Odds ratio (95% CI) | P-value* |
| Age                        |                        |         |                        |         |                        |         |
| 18–44                      | 2.77 (1.76, 4.35)      | <0.001  | 2.47 (1.43, 4.26)      | 0.014   | 3.51 (1.54, 7.98)      | 0.003   |
| 45–64                      | 2.28 (1.52, 3.43)      | <0.001  | 1.83 (1.13, 2.97)      |         | 3.6 (1.69, 7.7)        | 0.001   |
| 65+                        | Reference              |         | Reference              |         | Reference              |         |
| Gender                     |                        |         |                        |         |                        |         |
| Male                       | Reference              | 0.736   | Reference              | 0.714   | Reference              | 0.800   |
| Female                     | Reference              |         | Reference              |         | Reference              |         |
| Marital status             | 1.21 (0.92, 1.61)      | 0.177   | 1.32 (0.93, 1.86)      | 0.121   | 1.12 (0.68, 1.86)      | 0.654   |
| Married                    | Reference              |         | Reference              |         | Reference              |         |
| Race/ethnicity             |                        |         |                        |         |                        |         |
| White, non-Hispanic        | Reference              |         | Reference              |         | Reference              |         |
| Black, non-Hispanic        | 0.43 (0.34, 0.56)      | <0.001  | 0.38 (0.29, 0.51)      | 0.001   | 0.81 (0.42, 1.56)      | 0.523   |
| Hispanic                   | 0.74 (0.44, 1.24)      | 0.252   | 0.81 (0.45, 1.44)      | 0.471   | 0.36 (0.1, 1.23)       | 0.104   |
| Other                      | 0.89 (0.56, 1.42)      | 0.628   | 0.62 (0.34, 1.15)      | 0.129   | 1.45 (0.67, 3.12)      | 0.347   |
| Homelessness after 6 months|                        |         |                        |         |                        |         |
| No                         | Reference              | 0.023   | Reference              | 0.166   | Reference              | 0.052   |
| Yes                        | Reference              |         | Reference              |         | Reference              |         |
| Priority group             |                        |         |                        |         |                        |         |
| Group 1: service-connected disabilities | 1.03 (0.76, 1.39) | 0.861 | 1.04 (0.72, 1.5) | 0.839 | 1.02 (0.58, 1.8) | 0.949 |
| Group 5: financial insecurity | Reference               |         | Reference              |         | Reference              |         |
| Other than Groups 1 and 5 Urban/rural location | 1.11 (0.84, 1.49) | 0.457 | 1.04 (0.74, 1.46) | 0.823 | 1.32 (0.76, 2.32) | 0.328 |
| Urban                      | Reference              |         | Reference              |         | Reference              |         |
| Rural*                     | 1.46 (1.12, 1.90)      | 0.005   | –                      | –       | –                      | –       |
| Chronic conditions (from list of 28) |                        |         |                        |         |                        |         |
| Zero                       | Reference              | 0.546   | Reference              | 0.888   | Reference              | 0.391   |
| 1 to 2                     | 0.88 (0.58, 1.33)      | 0.546   | 0.96 (0.59, 1.59)      | 0.888   | 0.69 (0.3, 1.6)        | 0.391   |
| 3 or more                  | 0.76 (0.5, 1.16)       | 0.206   | 0.94 (0.57, 1.56)      | 0.821   | 0.44 (0.19, 1.03)      | 0.059   |
| Depression                 |                        |         |                        |         |                        |         |
| Yes                        | 1.02 (0.79, 1.33)      | 0.866   | 1.02 (0.75, 1.38)      | 0.923   | 1.17 (0.69, 1.99)      | 0.568   |
| No                         | Reference              |         | Reference              |         | Reference              |         |
| Post-traumatic stress disorder | 1.64 (1.27, 2.12) | <0.001 | 1.69 (1.25, 2.29) | 0.001 | 1.54 (0.95, 2.48) | 0.080 |
| Yes                        | Reference              |         | Reference              |         | Reference              |         |
| No                         | 1.64 (1.27, 2.12)      | <0.001  | 1.69 (1.25, 2.29)      | 0.001   | 1.54 (0.95, 2.48)      | 0.080   |
| Substance use disorder     |                        |         |                        |         |                        |         |
| Yes                        | 0.59 (0.46, 0.76)      | <0.001  | 0.58 (0.43, 0.78)      | 0.001   | 0.6 (0.37, 0.96)       | 0.032   |
| No                         | Reference              |         | Reference              |         | Reference              |         |
| Serious mental illness     | 1.20 (0.91, 1.58)      | 0.208   | 1.17 (0.84, 1.63)      | 0.358   | 1.36 (0.8, 2.3)        | 0.251   |
| Yes                        | Reference              |         | Reference              |         | Reference              |         |
| No                         | Reference              |         | Reference              |         | Reference              |         |

*All P-values derive from logistic regression
12 months after receipt. As a cross-sectional study with diagnoses identified in the 12 months prior to tablet receipt, some conditions may have resolved (e.g., depression) prior to the start of the use, thus leading to misclassification bias. The indicator of homelessness in this study was broad; e.g., it did not differentiate between chronic and temporary homelessness. Examining such differences was beyond the scope of this study. The reliability of the data indicating patients’ current homeless status may be hindered by the fact that Veterans experiencing homelessness may move frequently; hence, the electronic health record may not reflect the most recent residence. Future studies should examine whether different types of homelessness are differentially associated with technology adoption and use.

CONCLUSIONS

In providing hardware and wireless telehealth access, VA’s tablet distribution program is a promising model to help vulnerable individuals receive virtual care. But supportive structures and interventions may be needed (and are the focus of an ongoing qualitative study by the authors) to strengthen its success through training for digital literacy, accessibility for those with physical or other impairments, and dissemination of information to both patients and providers. Target groups among patients experiencing homelessness who may need more tablet assistance include those who are older, Black, or with a SUD. In general, while living in rural areas appeared to boost the use of video visits, rural patients facing multiple chronic conditions or access disadvantages would benefit from additional assistance in their adoption and use. Telehealth for vulnerable populations has become particularly salient during the COVID-19 pandemic. Yet without support for marginalized populations to access telehealth, the pandemic or digital divide may further widen the gulf between those with and without access to healthcare.

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