

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



Lynn A. Garvin, PhD, MBA<sup>1,2</sup> , Jiaqi Hu, MPH, MBBS<sup>3,4</sup>, Cindie Slightam, MPH<sup>3</sup>, D. Keith McInnes, ScD, MS<sup>2,5</sup>, and Donna M. Zulman, MD, MS<sup>3,4</sup>

<sup>1</sup>VA Center for Healthcare Organization and Implementation Research (CHOIR), VA Boston Healthcare System, 150 S. Huntington Avenue, Bldg 9, Rm 225, Boston, MA, USA; <sup>2</sup>Department of Health Law, Policy and Management, Boston University School of Public Health, Boston, MA, USA; <sup>3</sup>VA Center for Innovation to Implementation (Ci2i), VA Palo Alto Health Care System, Menlo Park, CA, USA; <sup>4</sup>Division of Primary Care and Population Health, Stanford University School of Medicine, Stanford, CA, USA; <sup>5</sup>VA Center for Healthcare Organization and Implementation Research (CHOIR), VA Bedford Healthcare System, Bedford, MA, USA.

**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 telemental 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 = 0.43;  $P < .001$ ) 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.

J Gen Intern Med 36(8):2274–82

DOI: 10.1007/s11606-021-06900-8

©This is a U.S. government work and not under copyright protection in the U.S.; foreign copyright protection may apply 2021

The US Department of Veterans Affairs (VA) is a leader in clinical video telehealth to increase Veterans' access to high-quality care.<sup>1</sup> In 2018 alone, VA healthcare systems provided more than 2.29 million telehealth episodes of video telehealth care to 12% of eligible Veterans.<sup>2</sup> 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,<sup>3–5</sup> primary care,<sup>6,7</sup> and specialty ambulatory care.<sup>8–10</sup> Patient populations who face sociodemographic and clinical challenges (e.g., travel distance to care for rural patients) can benefit from video telehealth.<sup>11–16</sup> Other vulnerable populations that have been shown to benefit from video telehealth include older adults,<sup>17–21</sup> African American and Hispanic adults,<sup>22–25</sup> and Native and Alaskan American adults;<sup>26,27</sup> and patients with mental health conditions such as anxiety and depression<sup>28</sup> or anxiety and alcohol use disorder,<sup>29,30</sup> post-traumatic stress disorder (PTSD),<sup>31,32</sup> substance use disorder (SUD);<sup>33–35</sup> or challenges with medication adherence.<sup>36</sup>

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.<sup>37,38</sup> Veterans experiencing homelessness

D. Keith McInnes and Donna M. Zulman contributed equally to this manuscript.

## Prior Presentations

Garvin LA, Hu J, Slightam C, McInnes DK, Zulman DM. Virtual Outreach: Enhancing Access for Homeless Veterans through Video Telehealth Tablets. Oral presentation at the 2020 Virtual Annual Research Meeting of *AcademyHealth* on August 6, 2020.

Received July 5, 2020

Accepted May 3, 2021

Published online May 23, 2021

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.<sup>39,40</sup>

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.<sup>41</sup> 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.<sup>42</sup>

Previous evaluations have shown that the tablet distribution program successfully reached patients with clinical or social barriers and generated cost savings for such patients.<sup>43,44</sup> 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.<sup>45,46</sup> 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 patient, 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.<sup>43,44</sup> 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.<sup>47</sup> 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.<sup>48</sup> 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.<sup>49,50</sup> (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.<sup>6</sup> 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

**Table 1 Centers for Disease Control and Prevention (CDC) Diagnosis Codes and VA Decision Support System (DSS) Identifiers Used to Determine Homelessness Among Veterans****Classification of a Veteran experiencing homelessness**

For purposes of our study, a Veteran was classified as experiencing homelessness if there were one CDC International Classification of Disease ICD-9/ICD-10 code,<sup>49</sup> specifically V60.0 (lack of housing) or Z59.0 (homelessness); or one VA DSS Identifier<sup>50</sup> (VA's 3-digit "stop code" reflecting type of outpatient care) related to the utilization of VA homelessness services (504, 507, 508, 511, 522, 528, 529, 530, 555, 556, and 590) during the 12 months prior to tablet distribution.

**CDC ICD Codes**

ICD-9 Code V60.0 (lack of housing)

ICD-10 Code Z59.0 (homelessness)

**VA DSS Identifiers**

VA Clinic Contact Points (called "stop codes"):

- 504 Veterans receiving services from Grant and Per Diem Program Office – Group Assistance
- 507 homeless or at-risk Veterans or family members receiving services from VA clinical staff of Housing and Urban Development – VA Supported Housing (HUD-VASH) Programs – Group Assistance
- 511 homeless Veterans or family members receiving services from Grant and Per Diem Program Office – Individual Assistance
- 522 or 530 homeless Veteran or family members receiving services from Department of Housing and Urban Development VA Shared Housing Program [HUD-VASH]] – Individual Assistance
- 508 HCHV/HCMV Group [VA Health Care for Homeless Veterans/Homeless Chronically Ill]
- 528 telephone services/homeless mentally ill [HMI]
- 529 Health Care for Homeless Veterans (HCHV) services – restricted to programs approved by the Northeast Program Evaluation Center (NEPEC)
- 555 homeless Veteran Community Employment Services – Individual Assistance
- 556 homeless Veteran Community Employment Services – Group Assistance
- 590 community outreach to homeless Veterans

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  $\leq 0.05$  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  $\geq 60$  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  $\geq 3$  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

Table 2 Characteristics and Bivariate Comparisons (Unadjusted) of Veteran Telehealth Tablet Recipients

	All housed N=10,678 (%)	All homeless N=1470 (%)	P-value*	Urban homeless N=1,048 (%)	Rural homeless N=397 (%)	P-value*
Age			<0.001			0.010
18-44	2770 (25.9)	431 (29.3)		282 (26.9)	137 (34.5)	
45-64	4092 (38.3)	885 (60.2)		657 (62.7)	216 (54.4)	
65+	3816 (35.7)	154 (10.5)		109 (10.4)	44 (11.1)	
Gender			0.022			0.041
Female	2088 (19.6)	325 (22.1)		245 (23.4)	73 (18.4)	
Male	8587 (80.4)	1145 (77.9)		803 (76.6)	324 (81.6)	
Marital status			<0.001			<0.001
Other	4923 (47.0)	1141 (79.2)		833 (81.5)	286 (72.6)	
Married	5561 (53.0)	300 (20.8)		189 (18.5)	108 (27.4)	
Race/ethnicity			<0.001			<0.001
White, non-Hispanic	6772 (65.8)	732 (51.4)		432 (42.8)	290 (74.0)	
Black, non-Hispanic	2177 (21.2)	528 (37.1)		470 (46.6)	50 (12.8)	
Hispanic	532 (5.2)	69 (4.8)		56 (5.6)	12 (3.1)	
Other	809 (7.9)	94 (6.6)		51 (5.1)	40 (10.3)	
Rural/urban location			<0.001			–
Rural	4941 (46.8)	397 (27.5)		–	–	
Urban	5606 (53.2)	1048 (72.5)		–	–	
Homeless after 6 months			<0.001			<0.001
No	10,467 (98.0)	563 (38.3)		366 (34.9)	187 (47.1)	
Yes	211 (2.0)	907 (61.7)		682 (65.1)	210 (52.9)	
Enrollment priority group			<0.001			0.510
Group 1: service-connected disabilities	6273 (59.3)	488 (33.6)		345 (33.0)	143 (36.2)	
Group 5: financial insecurity	1561 (14.8)	558 (38.4)		404 (38.7)	143 (36.2)	
Other than Groups 1 and 5	2742 (25.9)	408 (28.1)		295 (28.3)	109 (27.9)	
Chronic conditions (from list of 28)			0.025			0.560
Zero	1064 (10.0)	154 (10.5)		97 (9.3)	44 (11.1)	
1 to 2	3553 (33.3)	536 (36.5)		387 (36.9)	134 (34.1)	
3 or more	6061 (56.8)	780 (53.1)		564 (53.8)	212 (53.4)	
Any MH diagnoses	8351 (78.2)	1313 (89.3)	<0.001	931 (88.8)	365 (91.9)	0.083
Serious mental illness	1107 (10.4)	321 (21.8)	<0.001	219 (20.9)	99 (24.9)	0.098
Post-traumatic stress disorder	5290 (49.5)	741 (50.4)	0.530	516 (49.2)	214 (53.9)	0.110
Substance use disorder	2145 (20.1)	784 (53.3)	<0.001	561 (53.5)	214 (53.9)	0.900
Depression	6067 (56.8)	1032 (70.2)	<0.001	737 (70.3)	285 (71.8)	0.590
Suicide risk flag			<0.001			0.029
No	10,410 (97.5)	1340 (91.2)		965 (92.1)	351 (88.4)	
Yes	268 (2.5)	130 (8.8)		83 (7.9)	46 (11.6)	
Utilization of in-person care** (unit is visits) <sup>#</sup>						
Any mental health	7033 (67.1)	1358 (93.7)	<0.001	965 (93.2)	372 (94.7)	0.33
Mental health visit, mean (SD)	4.7 (10.1)	20.0 (26.8)	<0.001	20.6 (26.0)	18.9 (29.4)	0.32
Any primary care	8639 (82.4)	1174 (81.0)	0.19	856 (82.7)	305 (77.6)	0.027
Primary care visit, mean (SD)	3.5 (4.1)	3.4 (4.0)	0.58	3.5 (4.0)	3.2 (3.8)	0.15
Any specialty care	9643 (91.9)	1313 (90.6)	0.071	955 (92.3)	341 (86.8)	0.001
Specialty care visit, mean (SD)	14.4 (19.7)	13.5 (17.5)	0.11	14.5 (18.6)	11.3 (14.2)	0.

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. <sup>#</sup>Unlike other variables in this table for which the unit is individual Veteran, for this variable, the unit is healthcare visits

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%

**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 (60.7)	
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	220 (28.1)	188 (28.1)	
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			0.001
Serious mental illness	691 (86.9)	622 (92.1)	
Post-traumatic stress disorder	162 (20.4)	159 (23.6)	0.140
Substance use disorder	350 (44.0)	391 (57.9)	<0.001
Depression	463 (58.2)	321 (47.6)	<0.001
Suicide risk flag	554 (69.7)	478 (70.8)	0.640
No	724 (91.1)	616 (91.3)	0.900
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.<sup>51</sup> 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.<sup>52</sup> 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.<sup>53</sup> 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.<sup>54</sup>

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.<sup>55</sup> Implicit bias on the part of healthcare workers and structural racism in the healthcare system may also contribute to the disparities seen.<sup>56,57</sup> 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 through 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.<sup>22,58</sup>

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.<sup>59</sup> 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.<sup>60</sup> A recent study of VA tablets found that many Veterans with SUD prefer video visits to in-person visits.<sup>61</sup>

Two characteristics were positively associated with tablet use among Veterans experiencing homelessness: a PTSD

**Table 4 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 N=615 (%)	Urban homeless tablet users N=433 (%)	P- value*	Rural homeless tablet non-users N=165 (%)	Rural homeless tablet users N=232 (%)	P- value*
Age			<0.001			<0.001
18–44	134 (21.8)	148 (34.2)		48 (29.1)	89 (38.4)	
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			0.390			0.160
Female	138 (22.4)	107 (24.7)		25 (15.2)	48 (20.7)	
Male	477 (77.6)	326 (75.3)		140 (84.8)	184 (79.3)	
Marital status			0.004			0.700
Other	506 (84.5)	327 (77.3)		120 (73.6)	166 (71.9)	
Married	93 (15.5)	96 (22.7)		43 (26.4)	65 (28.1)	
Race/ethnicity			<0.001			0.260
White, non-Hispanic	209 (35.1)	223 (53.9)		121 (74.2)	169 (73.8)	
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			0.003			0.047
No	192 (31.2)	174 (40.2)		68 (41.2)	119 (51.3)	
Yes	423 (68.8)	259 (59.8)		97 (58.8)	113 (48.7)	
Priority group			0.005			0.260
Group 1: service- connected disabilities	179 (29.2)	166 (38.4)		56 (34.1)	87 (37.7)	
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)			0.140			
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)	0.013	150 (90.9)	215 (92.7)	0.520
Serious mental illness	122 (19.8)	97 (22.4)	0.310	38 (23.0)	61 (26.3)	0.460
Post-traumatic stress dis- order	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			0.760			0.780
No	565 (91.9)	400 (92.4)		145 (87.9)	206 (88.8)	
Yes	50 (8.1)	33 (7.6)		20 (12.1)	26 (11.2)	

For homeless Veteran users and non-users: missing values exists in marital status (29), race/ethnicity (47), enrollment priority group (16), geographic location (25), drive time to VA secondary care (29)

For urban homeless Veteran users: missing values exists in marital status (26), race/ethnicity (39), enrollment priority group (4)

For rural homeless Veteran users: missing values exists in marital status (3), race/ethnicity (5), enrollment priority group (2), drive time to VA secondary care (4). \*All P-values derive from chi-square tests comparing tablet users and non-users

diagnosis and residing in rural areas. Our finding that Veterans experiencing homelessness with PTSD demonstrated greater likelihood of tablet use is congruent with prior evidence of PTSD patients' acceptance and satisfaction with telemental health.<sup>31</sup> A literature review of the adoption of telemental health for Veterans with PTSD found several facilitators: access to necessary electronic devices, availability of PTSD-trained clinicians, and supportive community.<sup>32</sup> An examination of both video visits and My HealtheVet patient portal use among Veterans receiving VA mental health services found that Veterans with PTSD had substantially higher odds of video visit engagement (AOR = 1.74, 95% CI 1.58–1.91) and being a dual user of both technologies (AOR = 1.86, 95% CI 1.77–1.96) compared to Veterans without PTSD.<sup>55</sup>

The second factor positively associated with tablet use was rurality. Veterans experiencing homelessness residing in rural settings were more likely to use tablets than their urban

counterparts (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.<sup>55</sup> 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.

## Limitations

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 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 N=6133	Homeless tablet users N=675	P-value	Urban homeless tablet users N=433	Rural homeless tablet users N=232	P-value
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 visits, N (%)	574 (9.4)	34 (5.0)	<0.001	30 (6.9)	4 (1.7)	0.004
Mean (SD)	0.2 (0.7)	0.1 (0.4)	0.003	0.1 (0.5)	0 (0.2)	0.005
Any 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)	0.001	3.51 (1.54, 7.98)	0.003
45–64	2.28 (1.52, 3.43)	<0.001	1.83 (1.13, 2.97)	0.014	3.6 (1.69, 7.7)	0.001
65+	Reference		Reference		Reference	
Gender						
Male	Reference		Reference		Reference	
Female	0.95 (0.72, 1.27)	0.736	0.94 (0.67, 1.31)	0.714	1.08 (0.6, 1.94)	0.800
Marital status						
Married	1.21 (0.92, 1.61)	0.177	1.32 (0.93, 1.86)	0.121	1.12 (0.68, 1.86)	0.654
Other	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		Reference		Reference	
Yes	0.75 (0.59, 0.96)	0.023	0.81 (0.61, 1.09)	0.166	0.64 (0.4, 1)	0.052
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	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/rural location						
Urban	Reference	–	–		–	
Rural*	1.46 (1.12, 1.90)	0.005	–		–	
Chronic conditions (from list of 28)						
Zero	Reference		Reference		Reference	
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						
Yes	1.64 (1.27, 2.12)	<0.001	1.69 (1.25, 2.29)	0.001	1.54 (0.95, 2.48)	0.080
No	Reference		Reference		Reference	
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						
Yes	1.20 (0.91, 1.58)	0.208	1.17 (0.84, 1.63)	0.358	1.36 (0.8, 2.3)	0.251
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.

**Corresponding Author:** Lynn A. Garvin, PhD, MBA; VA Center for Healthcare Organization and Implementation Research (CHOIR), VA Boston Healthcare System, 150 S. Huntington Avenue, Bldg 9, Rm 225, Boston, MA 02130, USA (e-mail: Lynn.Garvin@va.gov).

**Funding:** Dr. Garvin's and Dr. McInnes' work was funded by the US Department of Veterans Affairs (VA) National Center for Homelessness Among Veterans (Garvin, XVA 11-056). Dr. Zulman's, Ms. Hu's, and Ms. Slightam's work was funded by the VA Health Services Research & Development/Quality Enhancement Research Initiative (HSR&D/QUERI) (Zulman, PEI 18-205). The views expressed in this manuscript are those of the authors and do not necessarily reflect the views of the US Department of Veterans Affairs or the US government.

### Declarations:

**Conflict of Interest:** The authors declare that they do not have a conflict of interest.

## REFERENCES

1. Darkins A, Foster L, Anderson C, Goldschmidt L, Selvin G. The design, implementation, and operational management of a comprehensive quality management program to support national telehealth networks. *Telemedicine and e-Health*. 2013;19(7):557-564.
2. Adams SV, Mader MJ, Bollinger MJ, Wong ES, Hudson TJ, Littman AJ. Utilization of Interactive Clinical Video Telemedicine by Rural and Urban Veterans in the Veterans Health Administration Health Care System. *Journal of Rural Health*. 2019;35(3):308-318.
3. Chen CK, Palfrey A, Shreck E, et al. Implementation of Telemental Health (TMH) psychological services for rural veterans at the VA New York Harbor Healthcare System. *Psychological Services*. 2019;
4. Bready TW, Goodman CS, Haynes C, McDermott K, Rowland JA. Improvement of postinpatient psychiatric follow-up for veterans using telehealth. *American Journal of Health-System Pharmacy*. 2020;77(4):288-294.
5. Shreck E, Nehrig N, Schneider JA, et al. Barriers and facilitators to implementing a US Department of Veterans Affairs Telemental Health (TMH) program for rural veterans. *Journal of Rural Mental Health*. 2020;41(1):1.
6. Heyworth L, Corrigan K, Schectman G. Video Visits in Primary Care: A Nationwide Pilot Study at the Veterans Health Administration. Springer 233 Spring St, New York, NY 10013 USA; 2017:S807-S808.
7. Ambert-Pompey S, Konecky B, Ahlstrom D. Improving Access: Team-based Primary Care via Telehealth in the VA. *SGIM Forum*. 2017;40(10):1-3.
8. Eberly LA, Kallan MJ, Julien HM, et al. Patient characteristics associated with telemedicine access for primary and specialty ambulatory care during the COVID-19 pandemic. *JAMA network open*. 2020;3(12):e2031640-e2031640.
9. Jordan DN, Jessen CM, Ferucci ED. Views of Patients and Providers on the Use of Telemedicine for Chronic Disease Specialty Care in the Alaska Native Population. *Telemedicine and e-Health*. 2020;
10. Leshner AP, Fakhry SM, DuBose-Morris R, et al. Development and evolution of a statewide outpatient consultation service: leveraging telemedicine to improve access to specialty care. *Population health management*. 2020;23(1):20-28.
11. Lum HD, Nearing K, Pimentel CB, Levy CR, Hung WW. Anywhere to Anywhere: Use of Telehealth to Increase Health Care Access for Older, Rural Veterans. *Public Policy & Aging Report*. 2020;30(1):12-18.
12. Shura RD, Bready TW, Tupler LA. Telehealth in Response to the COVID-19 Pandemic in Rural Veteran and Military Beneficiaries. *The Journal of Rural Health*. 2021;37:200-204.
13. Padala KP, Wilson KB, Gauss CH, Stovall JD, Padala PR. VA video connect for clinical care in older adults in a rural state during the COVID-19 pandemic: cross-sectional study. *J Med Internet Res*. 2020;22(9):e21561.
14. Byrne T, Cusack M, True G, Montgomery AE, Smith M. "You Don't See Them on the Streets of Your Town": Challenges and Strategies for Serving Unstably Housed Veterans in Rural Areas. *Housing Policy Debate*. 2020;30(3):409-430.
15. Cotner B, Ottomanelli L, O'Connor DR, Njoh E, Jones V. Delivering vocational services to rural veterans with disabilities through video telerehabilitation. *Archives of Physical Medicine and Rehabilitation*. 2016;97(10):e95.
16. Glynn LH, Chen JA, Dawson TC, Gelman H, Zeliadt SB. Bringing chronic-pain care to rural veterans: A telehealth pilot program description. *Psychological Services*. 2020;
17. Cheng MK, Allison TA, McSteen BW, Cattle CJ, Lo DT. The Adoption of Video Visits During the COVID-19 Pandemic by VA Home Based Primary Care. *Journal of the American Geriatrics Society*. 2020;
18. Kruse C, Fohn J, Wilson N, Patlan EN, Zipp S, Mileski M. Utilization barriers and medical outcomes Commensurate with the use of telehealth among older adults: systematic review. *JMIR medical informatics*. 2020;8(8):e20359.
19. Moo LR, Gately ME, Jafri Z, Shirk SD. Home-based video telemedicine for dementia management. *Clinical Gerontologist*. 2020;43(2):193-203.
20. Ali D, Gillie M, Carstarphen KJ. Bridging the digital divide for vulnerable patient telehealth. *Innovation in Aging*. 2020;4(Suppl 1):928.
21. Parker S, Prince A, Thomas L, Song H, Milosevic D, Harris MF. Electronic, mobile and telehealth tools for vulnerable patients with chronic disease: a systematic review and realist synthesis. *BMJ Open*. 2018;8(8):e019192.



22. Pekmezaris R, Kozikowski A, Pascarelli B, et al. A Telehealth-Delivered Pulmonary Rehabilitation Intervention in Underserved Hispanic and African American Patients With Chronic Obstructive Pulmonary Disease: A Community-Based Participatory Research Approach. *JMIR Formative Research*. 2020;4(1):e13197.
23. King DA KS, Polo J, Solomon J, Pekmezaris R, Hajizadeh N. . Optimizing Telehealth Experience Design Through Usability Testing in Hispanic American and African American Patient Populations: Observational Study *JMIR Rehabil Assist Technol*. 2020;7(2):e16004.
24. Murry VM, Berkel C, Inniss-Thompson MN, Debreaux ML. Pathways for African American success: Results of three-arm randomized trial to test the effects of technology-based delivery for rural African American families. *Journal of pediatric psychology*. 2019;44(3):375-387.
25. McCall T, Iii B, McCall R, Khairat S. The Use of Culturally-Tailored Telehealth Interventions in Managing Anxiety and Depression in African American Adults: A Systematic Review. *Studies in health technology and informatics*. 2019;264:1728-1729.
26. Kohn LL, Introcaso CE. A Cultural Context for Providing Dermatologic Care to American Indian and Alaskan Native Communities Through Telehealth. *JAMA Dermatology*. 2019;155(8):884-886.
27. Morenz AM, Wescott S, Mostaghimi A, Sequist TD, Tobey M. Evaluation of barriers to telehealth programs and dermatological care for American Indian individuals in rural communities. *JAMA Dermatology*. 2019;155(8):899-905.
28. Myers US, Coulon S, Knies K, et al. Lessons learned in implementing VA video connect for evidence-based psychotherapies for anxiety and depression in the Veterans Healthcare Administration. *Journal of technology in behavioral science*. 2020:1-7.
29. Ecker AH, Amspoker AB, Hogan JB, Lindsay JA. The Impact of Co-occurring Anxiety and Alcohol Use Disorders on Video Telehealth Utilization Among Rural Veterans. *Journal of technology in behavioral science*. 2020:1-6.
30. Kruse CS, Lee K, Watson JB, Lobo LG, Stoppelmoo AG, Oyibo SE. Measures of effectiveness, efficiency, and quality of telemedicine in the management of alcohol abuse, addiction, and rehabilitation: systematic review. *J Med Internet Res*. 2020;22(1):e13252.
31. Turgoose D, Ashwick R, Murphy D. Systematic review of lessons learned from delivering tele-therapy to veterans with post-traumatic stress disorder. *Journal of telemedicine and telecare*. 2018;24(9):575-585.
32. Kruse CS, Atkins JM, Baker TD, Gonzales EN, Paul JL, Brooks M. Factors influencing the adoption of telemedicine for treatment of military veterans with post-traumatic stress disorder. *Journal of rehabilitation medicine*. 2018;50(5):385-392.
33. Lin LA, Casteel D, Shigekawa E, Weyrich MS, Roby DH, McMenamin SB. Telemedicine-delivered treatment interventions for substance use disorders: A systematic review. *J Subst Abuse Treat*. 2019;101:38-49.
34. Lin L, Fernandez AC, Bonar EE. Telehealth for Substance-Using Populations in the Age of Coronavirus Disease 2019: Recommendations to Enhance Adoption. *JAMA Psychiatry*. 2020;77(12):1209-1210. doi:<https://doi.org/10.1001/jamapsychiatry.2020.1698>
35. Brunet N, Moore, D. T., Lendvai Wischik, D., Matlocks, K. M., & Rosen, M. I. Increasing buprenorphine access for veterans with opioid use disorder in rural clinics using telemedicine. *Substance Abuse*. 2020:1-8.
36. Basit SA, Mathews N, Kunik ME. Telemedicine interventions for medication adherence in mental illness: A systematic review. *General hospital psychiatry*. 2020;62:28-36.
37. Henry M, Watt R, Mahathay A, Ouellette J, Sitler A. *The 2019 Annual Homeless Assessment Report (AHAR) to Congress, PART 1: Point-in-Time Estimates of Homelessness*. Washington, DC: Office of Community Planning and Development. US Dept of Housing and Urban Development, January 2020. Available at: <https://files.hudexchange.info/resources/documents/2019-AHAR-Part-1.pdf> Accessed June 1, 2020.
38. Tsai J, Snitkin M, Trevisan L, Kraus SW, Pietrzak RH. Awareness of suicide prevention programs among US military veterans. *Administration and Policy in Mental Health and Mental Health Services Research*. 2020;47(1):115-125.
39. McInnes DK, Cutrona SL. Homeless Veterans and Use of Information Technology. *Homelessness Among US Veterans: Critical Perspectives*. 2018:245.
40. Miller CJ, McInnes DK, Stolzmann K, Bauer MS. Interest in use of technology for healthcare among veterans receiving treatment for mental health. *Telemedicine and e-Health*. 2016;22(10):847-854.
41. Zulman DM, O'Brien C, Slightam C, Nevedal A, Breland JY. Strategies to engage high-risk, complex patients in intensive outpatient care programs. *J Gen Intern Med*. 2016;31:S405-S405.
42. Zulman DM, Chang ET, Wong A, et al. Effects of intensive primary care on high-need patient experiences: Survey findings from a Veterans Affairs randomized quality improvement trial. *J Gen Intern Med*. 2019:1-7.
43. Zulman DM, Wong EP, Slightam C, et al. Making connections: nationwide implementation of video telehealth tablets to address access barriers in veterans. *JAMA Open*. 2019;2(3):323-329.
44. Jacobs JC, Hu J, Slightam C, Gregory A, Zulman DM. Virtual Savings: Patient-Reported Time and Money Savings from a VA National Telehealth Tablet Initiative. *Telemedicine and e-Health*. 2019.
45. Belkora J, Volz S, Loth M, et al. Coaching patients in the use of decision and communication aids: RE-AIM evaluation of a patient support program. *BMC Health Serv Res*. 2015;15(1):209.
46. Glasgow RE, Vogt TM, Boles SM. Evaluating the public health impact of health promotion interventions: the RE-AIM framework. *American journal of public health*. 1999;89(9):1322-1327.
47. US Dept of Veterans Affairs, Office of Rural Health, Definition of Rurality. Available at: <https://www.ruralhealth.va.gov/rural-definition.asp>.
48. Montgomery AE, Szymkowiak D, Tsai J. Housing Instability and Homeless Program Use Among Veterans: The Intersection of Race, Sex, and Homelessness. *Housing Policy Debate*. 2020;30(3):396-408.
49. Centers for Disease Control and Prevention, National Center for Health Statistics. <https://www.cdc.gov/nchs/icd/icd9.htm> [Accessed on: March 14, 2021].
50. US Department of Veterans Affairs, Managerial Cost Accounting Office, Program Documents – FY21 Mid-Year Active Stop Codes. [http://vaww.dss.med.va.gov/programdocs/pd\\_oident.asp](http://vaww.dss.med.va.gov/programdocs/pd_oident.asp) [Accessed on: March 14, 2021].
51. Wildenbos GA, Maasri K, Jaspers M, Peute L. Older adults using a patient portal: registration and experiences, one year after implementation. *Digital health*. 2018;4:2055207618797883.
52. Understanding PTSD and Aging. Washington, DC: National Center for PTSD, US Dept of Veterans Affairs. Published September 2019. [https://www.ptsd.va.gov/publications/print/understandingptsd\\_aging\\_booklet.pdf](https://www.ptsd.va.gov/publications/print/understandingptsd_aging_booklet.pdf) []].
53. Currie M, Philip LJ, Roberts A. Attitudes towards the use and acceptance of eHealth technologies: a case study of older adults living with chronic pain and implications for rural healthcare. *BMC Health Serv Res*. 2015;15(1):162.
54. Connolly SL, Miller CJ, Koenig CJ, et al. Veterans' attitudes toward smartphone App use for mental health care: qualitative study of rurality and age differences. *JMIR mHealth and uHealth*. 2018;6(8):e10748.
55. Abel EA, Shimada SL, Wang K, et al. Dual use of a patient portal and clinical video telehealth by veterans with mental health diagnoses: retrospective, cross-sectional analysis. *J Med Internet Res*. 2018;20(11):e11350.
56. Eliacin J, Matthias MS, Cunningham B, Burgess DJ. Veterans' perceptions of racial bias in VA mental healthcare and their impacts on patient engagement and patient-provider communication. *Patient Educ Couns*. 2020;103(9):1798-1804.
57. Milam AJ, Furr-Holden D, Edwards-Johnson J, et al. Are clinicians contributing to excess African American COVID-19 deaths? Unbeknownst to them, they may be. *Health Equity*. 2020;4(1):139-141.
58. Sewell AA. Disaggregating ethnoracial disparities in physician trust. *Social Science Research*. 2015;54:1-20.
59. Gaudiano B, Moitra E. Leveraging Mobile Technology to Improve the Treatment of Comorbid Bipolar and Substance Use Disorders. *J Addict Res Ther*. 2015;6:e126.
60. Kazemi DM, Borsari B, Levine MJ, Li S, Lamberson KA, Matta LA. A systematic review of the mHealth interventions to prevent alcohol and substance abuse. *J Health Commun*. 2017;22(5):413-432.
61. Slightam C, Gregory AJ, Hu J, et al. Patient Perceptions of Video Visits Using Veterans Affairs Telehealth Tablets: Survey Study. *J Med Internet Res*. 2020;22(4):e15682.