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Research and Applications

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Tablet distribution to veterans: an opportunity to increase patient portal adoption and use

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ABSTRACT

Objective: Examine whether distribution of tablets to patients with access barriers influences their adoption and use of patient portals.

Materials and Methods: This retrospective cohort study included Veterans Affairs (VA) patients ($n = 28\,659$) who received a VA-issued tablet between November 1, 2020 and April 30, 2021. Tablets included an app for VA's My Health*e*Vet (MHV) portal. Veterans were grouped into 3 MHV baseline user types (non-users, inactive users, and active users) based on MHV registration status and feature use pre-tablet receipt. Three multivariable models were estimated to examine the factors predicting (1) MHV registration among non-users, (2) any MHV feature use among inactive users, and (3) more MHV use among active users post-tablet receipt. Differences in feature use during the 6 months pre-/post-tablet were examined with McNemar chi-squared tests of proportions.

Results: In the 6 months post-tablet, 1298 (8%) non-users registered for MHV, 525 (24%) inactive users used at least one MHV feature, and 4234 (46%) active users increased feature use. Across veteran characteristics, there were differences in registration and feature use post-tablet, particularly among older adults and those without prior use of video visits ($P < .01$). Among active users, use of all features increased during the 6 months post-tablet, with the greatest differences in viewing prescription refills and scheduling appointments ($P < .01$).

Conclusion: Providing patients who experience barriers to in-person care with a portal-enabled device supports engagement in health information and management tasks. Additional strategies are needed to promote registration and digital inclusion among inactive and non-users of portals.

Key words: patient portals, personal health records, mobile health, veterans

INTRODUCTION

Patient portals offer a platform to promote patient self-management and shared decision-making,[1–3] yet numerous studies have found sociodemographic and digital disparities in use and under-use of portals.[4–11] Estimates indicate growing adoption of portals; from 2017 to 2020, the proportion of US adults who reported accessing their online medical record in the past 12 months increased from 27% to 38%.[12] Usage rates are even higher in some health systems, such as in the Department of Veterans Affairs (VA) where access to the My Health*e*Vet (MHV) portal reached approximately 43% (2.6M/6M) among veterans who received care in fiscal year 2020. Recently, several national policies and incentive programs have been implemented to improve patient access to personal health informa-

tion and health outcomes.[13–15] In 2020, 2 key final rules were passed as part of the 21st Century Cures Act and Centers for Medicare and Medicaid Services Interoperability and Patient Access regulations with the goal of facilitating patient access and use of health information through portals and secure third-party applications (apps).[13,15] The 21st Century Cures Act contains provisions to make health information more accessible through the adoption and implementation of standards and policies to prevent information blocking, like requiring that health providers give patients immediate access to their clinical notes.

Despite the increasing national focus and growing use of portals, individuals with barriers to care, limited technology access, lower socioeconomic status, racial minorities, and older adults generally have lower portal use.[4–11] These disparities can influence clinical care and outcomes; for example, use of portals has been associated with meaningful improvements in medication adherence and physiological measures (ie, hemoglobin A1c, low-density lipoproteins, blood pressure, viral load).[16–20] In addition, the ability for patients to manage their own appointments through portals has been associated with fewer missed appointments.[21–24] Patients and caregivers have also reported how access to clinical notes and test results enhanced their understanding of health conditions and helped them feel more engaged in their care.[25–28] As information continuity is important for patients moving throughout health systems, non-VA providers have described how receiving the continuity of care document generated from MHV improved their ability to make treatment decisions and reduced the number of tests ordered.[29] Given the established value of portals, approaches to promote greater access and more equitable use are needed to ensure that all patients can receive these benefits.

In 2016, the VA began distributing tablets with built-in data plans to veterans with geographic, clinical, or social barriers to in-person care. The tablets are pre-installed with a variety of VA mobile and web apps, including the MHV portal and the Video Connect app. Prior evaluations found that the tablets have been successfully distributed to veterans with access barriers and improved access to video visits.[30–32] Among initial tablet recipients between May 1, 2016 and September 30, 2017, 82% (5503/6745) engaged in a video visit.[30] Most of these video visits were focused on mental health care (54%).[30] Among veterans with mental health needs, tablet receipt was associated with more psychotherapy visits, more medication management visits, and higher continuity of care.[31] Tablets have also been linked to reduced suicide behavior and fewer emergency department visits among rural veterans with mental health conditions.[32] Additionally, in a national survey of tablet recipients ($n = 764$), 86% reported the tablets were easy to use, 84% felt they received the help needed to learn the technology, and 83% found them secure.[33] These evaluations suggest that most veterans who experience barriers to care are able to engage in video visits via a tablet; however, little is known about how tablet recipients utilize the MHV portal. Having a better understanding of the characteristics of those who register for and how they use MHV following tablet receipt is valuable to inform programs that support technology engagement among patients with access needs.

OBJECTIVES

Among veterans who received a VA-issued tablet, we aimed to (1) assess how the characteristics of tablet recipients vary across MHV user types (ie, non-users, inactive users, active users), (2) examine the factors predicting MHV registration and use during the 6 months post-tablet receipt, and (3) compare patterns of MHV feature use during the 6 months pre- and post-tablet receipt.

METHODS

Study setting

The VA's Offices of Rural Health and Connected Care began distributing tablets in 2016 with the goal of expanding video conferencing into the home to support veterans with hurdles to accessing care.[30] As of May 1, 2022, approximately 152 000 veterans had been shipped a tablet throughout the United States. Beginning in 2017, all tablets provided to veterans were iPads enabled with either Verizon or T-Mobile data plans and Wi-Fi capability. The estimated cost per tablet ranges from $595 to $835, depending on the carrier.[34] Veterans are eligible for a tablet if they lack a device or necessary Internet connectivity to have video visits, have a barrier to accessing in-person care, and require a VA appointment via video visit within the next 90 days. VA clinicians and social workers assess eligibility using a digital divide consult template within the VA's electronic health record (EHR).[35] Within this assessment, patient interest and potential benefits of using virtual care services through the tablet are discussed. If the patient is interested in using their own device or Internet connection, available subsidy programs are also discussed (eg, Lifeline Program, Emergency Broadband Benefit). Each veteran who obtains a tablet receives a call from the VA's Connected Device Support Team to assist with setup and conduct a test Video Connect call. During setup, there are no specific instructions on MHV as the primary focus is on testing the Video Connect app. Veterans can receive technical support from the Office of Connected Care Help Desk or local telehealth team.

VA's MHV is a free web-based personal health record and was one of the earliest portal implementations—available to VA patients from 2003.[36] Registered users can view their health information, securely message their care team, refill prescriptions, view labs, view or schedule appointments, and download portions of their health record through a "Blue Button" feature. Before September 15, 2021, 3 registered account types were available: basic, advanced, and premium accounts. The basic account provides limited access to health education and self-entered information that is not connected to an individual's VA health record. The advanced account is the default account upon registration and allows an individual to refill their prescriptions and access self-entered information. The account can be upgraded to a premium account through a short online or in-person authentication process that allows access to all MHV capabilities. As of September 15, 2021, the advanced account type was discontinued, and accounts that were not authenticated reverted to a basic account.[37]

Study design and cohort selection

We conducted a retrospective cohort study of VA patients who received a tablet between November 1, 2020 and April 30, 2021. Veterans were included in the cohort if they had at least one outpatient encounter in the 6 months prior to tablet receipt and had the tablet for at least 6 months. We excluded 2825 (9.0%) patients with incomplete sociodemographic data from the final analytic sample. This evaluation was conducted as part of the Virtual Access Quality Enhancement Research Initiative and was designated as a non-research quality improvement evaluation by VA's Office of Rural Health.

Data sources

Tablet distribution and usage data were obtained from VA's Denver Acquisitions and Logistics Center, the tablet vendor (Iron Bow Technologies, Herndon, Virginia), and VA's Corporate Data Warehouse (CDW). Patient sociodemographics, clinical characteristics, and clinical encounters were also obtained from CDW. MHV portal usage data were obtained from MHV Administrative Data. The number of chronic conditions and mental health conditions were calculated based on the list from Yoon et al.[38] The Census tract Rural Urban Commuting Area codes were used to define rurality based on each patient's ZIP code.[39] Housing instability was defined using stop codes reflecting use of homeless services and diagnosis codes.[40]

Outcome measures

The primary outcomes were MHV registration and use of key MHV features during the 6 months post-tablet receipt (hereafter referred to as "post-tablet"). We defined the registration date as the earlier of signing up for an advanced or premium account or use of a key feature (as these features require an advanced or premium account). The cohort was not affected by the discontinuation of the advanced account. Key features included: send message, view prescription refills, request prescription refills, view appointments, schedule appointments, view labs, or download personal data. These features are described by Javier et al,[9] with the exception of scheduling appointments which allows veterans to self-schedule certain types of appointments at participating VA facilities.[41] We examined portal outcomes in the 6 months post-tablet as our focus was on immediate engagement with MHV following tablet receipt.

Analysis

First, we characterized tablet recipients by grouping them into 3 MHV baseline user types (non-users, inactive users, and active users) based on their MHV registration status and use of key features in the 12 months pre-tablet receipt. This 12-month window was chosen to account for potential seasonality of care utilization throughout the year.[42] We defined non-users as those who had never registered for MHV pre-tablet; inactive users as registrants who did not use any MHV features during the 12 months pre-tablet; and active users as registrants who used at least one MHV feature during the 12 months pre-tablet.

Next, we estimated multivariable logistic regression models for each MHV user group to examine the factors predicting MHV adoption and use following tablet receipt. The models estimated: (1) MHV registration among the non-users, (2) any MHV feature use among the inactive users, and (3) increased use of MHV among the active users. Covariates included: age, gender, race, ethnicity, marital status, housing instability, number of chronic conditions, presence of a mental health condition, rurality, region, and care utilization in the 6 months pre-tablet (ie, video, phone, in-person visit). Among active users, we calculated the number of patients who increased their use of MHV in the 6 months post-tablet compared to the 6 months pre-tablet based on the number of distinct days of use of any key features over the number of days with a registered account during each period.

Finally, we examined temporal patterns of use across each of the 3 MHV user groups by visualizing the daily number of patients who used each key feature relative to the tablet shipment day or MHV registration day. For non-users, feature use was examined relative to the MHV registration day among new registrants during the 6 months post-registration. For inactive users, feature use was assessed relative to the tablet shipment day during the 6 months post-tablet. For active users, we examined feature use during both the 6 months pre-tablet and 6 months post-tablet, as this group had comparison data during both periods. McNemar chi-squared tests of proportions were used to examine differences in number of patients using each feature during the 6 months pre-tablet and 6 months post-tablet period among registered active users. All analyses were conducted in SAS (Cary, NC, USA).

RESULTS

Characteristics of tablet recipients

The final analytic sample comprised 28 659 veterans with a mean age of 63 years; a majority were male (88.0%), White non-Hispanic (59.7%), had 6 or more chronic conditions (64.3%), and had a mental health condition (77.6%). Almost a third lived in a rural location (30.2%), and 23.3% had housing instability. Prior to tablet receipt, most were MHV non-users (60.3%, 17 289), 7.7% (2199) were inactive users, and 32.0% (9171) were active users (Table 1). Compared to active users, non-users and inactive users were more often older, male, Black non-Hispanic, unmarried, unstably housed, and less engaged with video visits pre-tablet.

Predictors of portal registration and use following tablet receipt

Registration among non-users

Among the non-users of MHV at baseline, 7.5% (1298/17 289) registered in the 6 months post-tablet. Those with higher odds of registration were female (odds ratio [OR], 1.32; 95% confidence interval [CI], 1.11–1.59), married (OR, 1.59; 95% CI, 1.34–1.90), divorced or widowed (OR, 1.34; 95% CI, 1.14–1.59), or had a video visit during the 6 months pre-tablet (OR, 1.53; 95% CI, 1.36–1.72). Being middle aged (OR, 0.47; 95% CI, 0.39–0.57), older (OR, 0.29; 95% CI, 0.23–0.35), Black non-Hispanic (OR, 0.82, 95% CI, 0.72–0.94), or having housing instability (OR, 0.79; 95% CI, 0.69–0.92) were associated with lower odds of registration. There were a few regional differences, with those living in the Southeast having higher odds of registration (OR, 1.25; 95% CI, 1.06–1.48) and those in the Midwest having lower odds of registration (OR, 0.81; 95% CI, 0.69–0.95) compared to patients in the Northeast (see Figure 1).

Use of portal features among inactive users

Among the inactive users, comprising registrants who did not use MHV during the 12 months pre-tablet, 23.9% (525/2199) used at least one feature in the 6 months post-tablet. Similar to non-users, those who had a video visit during the 6 months pre-tablet were more likely to use MHV post-tablet (OR, 1.38; 95% CI, 1.12–1.70). Those who were middle aged (OR, 0.52; 95% CI, 0.39–0.70), older (OR, 0.32; 95% CI, 0.23–0.45), experiencing housing instability (OR, 0.77; 95% CI, 0.60–0.99), had a mental health condition (OR, 0.72; 95% CI, 0.54–0.95), or living in the Midwest (OR, 0.75; 95% CI, 0.56–0.99) compared to the Northeast had lower odds of MHV use in the 6 months post-tablet.

Increased use of portal features among active users

For the active users, which included registrants who used MHV during the 12 months pre-tablet, 46.2% (4234/9171) increased feature use of MHV in the 6 months post-tablet compared to the 6 months pre-tablet. Those who were middle aged (OR, 1.13; 95% CI, 1.01–

Table 1. Characteristics of tablet recipients by My HealtheVet use

	All tablet recipients $n = 28\,659$	Non-users $n = 17\,289$	Inactive users $n = 2199$	Active users $n = 9171$
Age				
18–44	3275 (11.4)	1203 (7.0)	297 (13.5)	1775 (19.4)
45–64	11 130 (38.8)	6188 (35.8)	954 (43.4)	3988 (43.4)
65+	14 254 (49.8)	9898 (57.2)	948 (43.1)	3408 (37.2)
Gender				
Female	3433 (12.0)	1502 (8.7)	288 (13.1)	1643 (17.9)
Male	25 226 (88.0)	15 787 (91.3)	1911 (86.9)	7528 (82.1)
Race and ethnicity				
Hispanic	1646 (5.7)	879 (5.1)	144 (6.6)	623 (6.8)
Black, non-Hispanic	9128 (31.9)	5731 (33.2)	804 (36.6)	2593 (28.3)
White, non-Hispanic	17 113 (59.7)	10 266 (59.3)	1195 (54.2)	5652 (61.6)
Other	772 (2.7)	413 (2.4)	56 (2.6)	303 (3.3)
Marital status				
Single	5284 (18.4)	3338 (19.3)	432 (19.6)	1514 (16.6)
Married	11 450 (40.0)	6260 (36.2)	816 (37.1)	4374 (47.7)
Divorced or widowed	11 925 (41.6)	7691 (44.5)	951 (43.3)	3283 (35.7)
Housing instability				
Yes	6671 (23.3)	4353 (25.2)	630 (28.7)	1688 (18.4)
No	21 988 (76.7)	12 936 (74.8)	1569 (71.3)	7483 (81.6)
Chronic conditions				
0–2	2179 (7.6)	1513 (8.8)	152 (6.9)	514 (5.6)
3–5	8049 (28.1)	4963 (28.7)	600 (27.3)	2486 (27.1)
6+	18 431 (64.3)	10 813 (62.5)	1447 (65.8)	6171 (67.3)
Mental health condition				
Yes	22 243 (77.6)	12 906 (74.7)	1816 (82.6)	7521 (82.0)
No	6416 (22.4)	4383 (25.3)	383 (17.4)	1650 (18.0)
Rurality				
Rural or highly rural	8649 (30.2)	5235 (30.3)	655 (29.8)	2759 (30.1)
Urban	20 010 (69.8)	12 054 (69.7)	1544 (70.2)	6412 (69.9)
Region				
Northeast	7576 (26.4)	4733 (27.4)	589 (26.8)	2254 (24.6)
Southeast	5839 (20.4)	3143 (18.2)	496 (22.6)	2200 (24.0)
Midwest	7380 (25.8)	4747 (27.4)	577 (26.2)	2056 (22.4)
Continental	3759 (13.1)	2238 (12.9)	258 (11.7)	1263 (13.8)
Pacific	4105 (14.3)	2428 (14.1)	279 (12.7)	1398 (15.2)
Care utilization 6 months pre-tablet				
Any video visit	11 935 (41.6)	5737 (33.2)	908 (41.3)	5290 (57.7)
Any phone visit	28 273 (98.7)	17 043 (98.6)	2177 (99.0)	9053 (98.7)
Any in-person visit	27 065 (94.4)	16 262 (94.1)	2073 (94.3)	8730 (95.2)

1.27), female (OR, 1.12; 95% CI, 1.00–1.26), had 3–5 chronic conditions (OR, 1.23; 95% CI, 1.01–1.49), or 6+ chronic conditions (OR, 1.21; 95% CI, 1.00–1.47) had higher odds of increased feature use 6 months post-tablet. Individuals who were Black non-Hispanic (OR, 0.84; 95% CI, 0.76–0.93) or residing in the Midwest (OR, 0.84; 95% CI, 0.74–0.94) or Pacific (OR, 0.85; 95% CI, 0.74–0.97) compared to the Northeast had lower odds of increased portal use in the 6 months post-tablet.

Patterns of portal use before and after tablet receipt

Portal registration and feature use among non-users

Among baseline non-users who registered for MHV post-tablet, 50% (648/1298) registered for MHV within the first 39 days post-tablet and 75% (971/1298) registered within 90 days (Figure 2A). When we examined feature use relative to registration date, the highest volume of use occurred on the same day as registration (Figure 2B). On the day of registration, approximately one-third (34.1%, 442/1298) viewed appointments, 21.7% (282/1298) requested a prescription refill, and 9.1% (118/1298) sent a secure message to their care team. Throughout the 6 months post-tablet, features were used most often during the first month after registration. Excluding the initial use on the day of registration, there was an average of 78 users a day in the first month versus an average of 36 users a day in the last 5 months. Sending a message was somewhat sustained throughout the 6 months following registration, with an average of 10 users sending messages per day in the first 3 months and 8 users sending messages per day in the last 3 months.

Use of portal features after tablet receipt among inactive users

Among baseline inactive users who used MHV in the 6 months post-tablet, most features were used sporadically (Figure 3). Feature use was highest during the initial month post-tablet, with an average of 8 users per day in the first month compared to an average of 5 users per day over the last 5 months. This is due to nearly a third of patients (30.1%, 158/525) who viewed appointments within the first month after tablet receipt, with an average of 5 users a day in

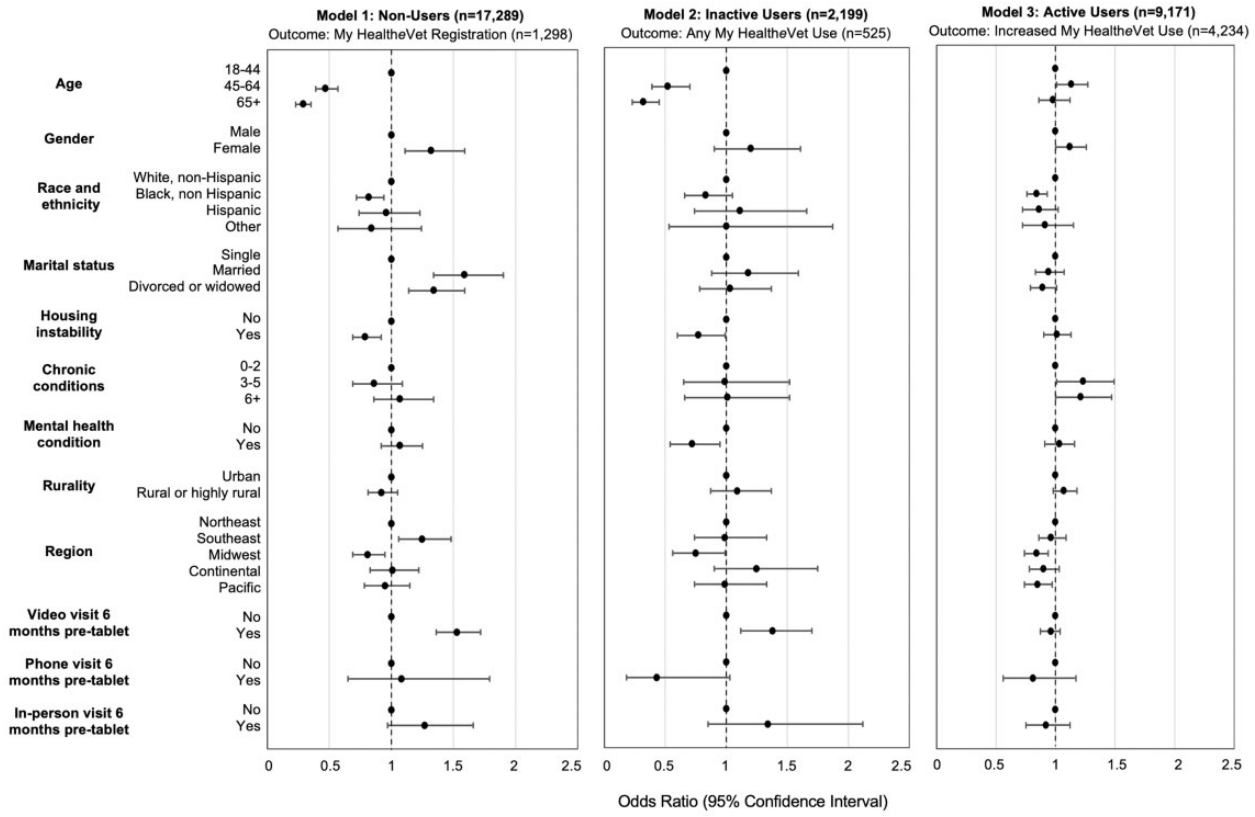

Figure 1. Adjusted odds ratios for My HealtheVet outcomes 6 months post-tablet.[a]

[a]Non-users were defined as those who had never registered for MHV pre-tablet; inactive users as registrants who did not use any MHV features during the 12 months pre-tablet; and active users as registrants who used at least one MHV feature during the 12 months pre-tablet. See Supplementary Appendix 1 for data table.

the first month versus an average of 3 users a day in the last 5 months.

Use of portal features before and after tablet receipt among active users

Figure 4 illustrates changes in MHV feature use among baseline active users during the 6 months before and after tablet receipt. Similar to non-users and inactive users, most active users engaged with features during the initial month post-tablet, with an average of 205 users a day in the first month versus an average of 182 users a day in the last 5 months. Viewing appointments was used most commonly, and 41.3% (3788/9171) used this feature within the first month, with an average of 126 users a day in the first month versus an average of 102 users a day in the last 5 months.

When we compared the number of patients who used each feature in the 6 months before and after tablet receipt, use of all features increased (Table 2). The greatest differences were in viewing prescription refills and scheduling appointments ($P < .01$). Notably, viewing prescription refills and scheduling appointments were used by the fewest patients during the 6 months pre-tablet, but their use surpassed viewing labs during the 6 months post-tablet.

DISCUSSION

Principal findings

Veterans with barriers to care who received a VA-issued tablet showed engagement with MHV across 3 different baseline user groups. Approximately 46% of active portal users increased their use during the 6 months after tablet receipt compared to the 6 months before receiving the tablet. A smaller proportion (24%) of registered but inactive users increased their use after tablet receipt as well. Notably, a small proportion of non-users (8%) took the opportunity to register for the portal within the first 6 months after tablet receipt. This was slightly higher than the average 6 month registration rate of all veterans receiving VA care in 2021 who were not registered (7%, 210 000/3M),[43] despite the fact that tablet recipients have limited access and experience with technology. These findings suggest that the VA's tablet initiative is having the intended effects of improving access to care among veterans with limited technology access and barriers to care. Health system-level initiatives that focus on improving patients' social and technical infrastructure are essential to move towards bridging the digital divide.

This study highlights that certain patient characteristics were associated with higher odds of portal registration and use, including being younger, previously engaged in video visits, and having stable housing. Additionally, half of the cohort had never registered and only a small percentage registered post-tablet, suggesting that additional strategies are needed to promote portal registration and digital inclusion among these subgroups. However, we found no meaningful differences in portal registration or use during the 6 months post-tablet for veterans living in rural areas versus urban areas. As one of the eligibility criteria for receiving a tablet could be a geographical barrier to care, this may reflect the value of providing tablets to veterans in rural areas. Individuals in rural areas are less likely than their suburban counterparts to have an Internet connec-

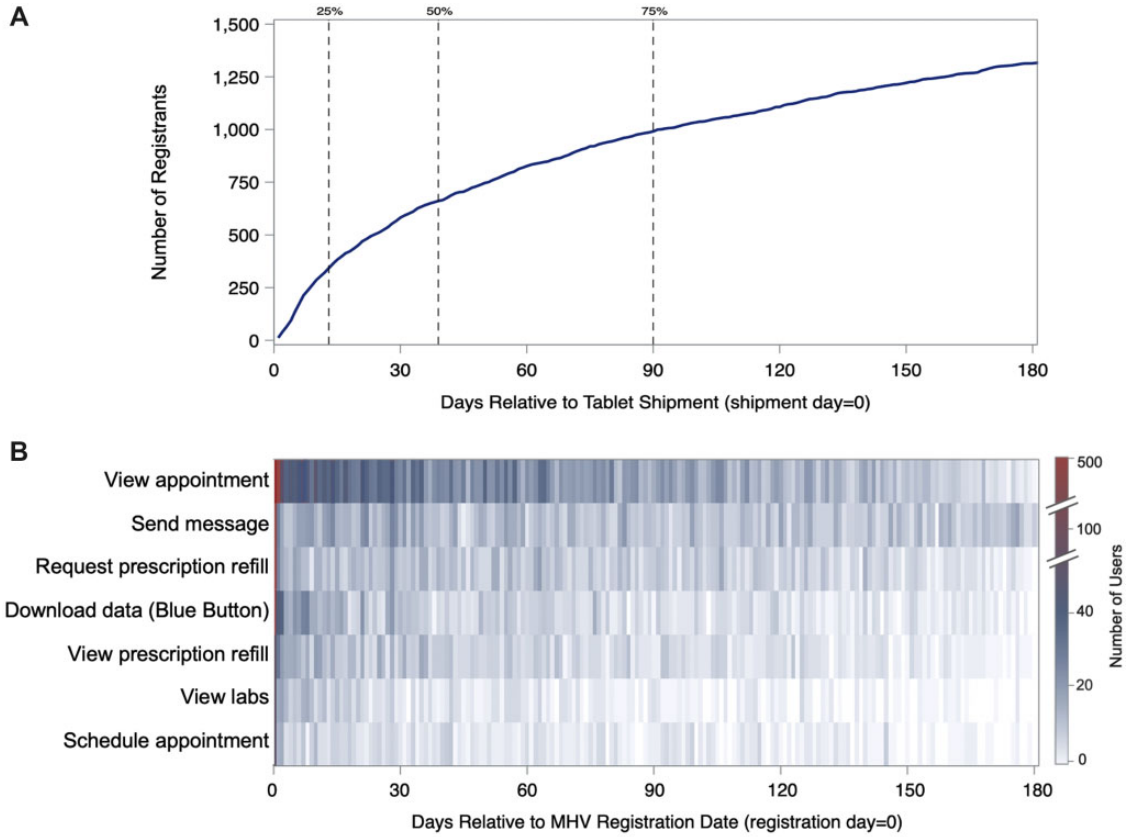

Figure 2. My HealtheVet registration (A) and feature use (B) among baseline portal non-users after tablet receipt ($n = 1298$).

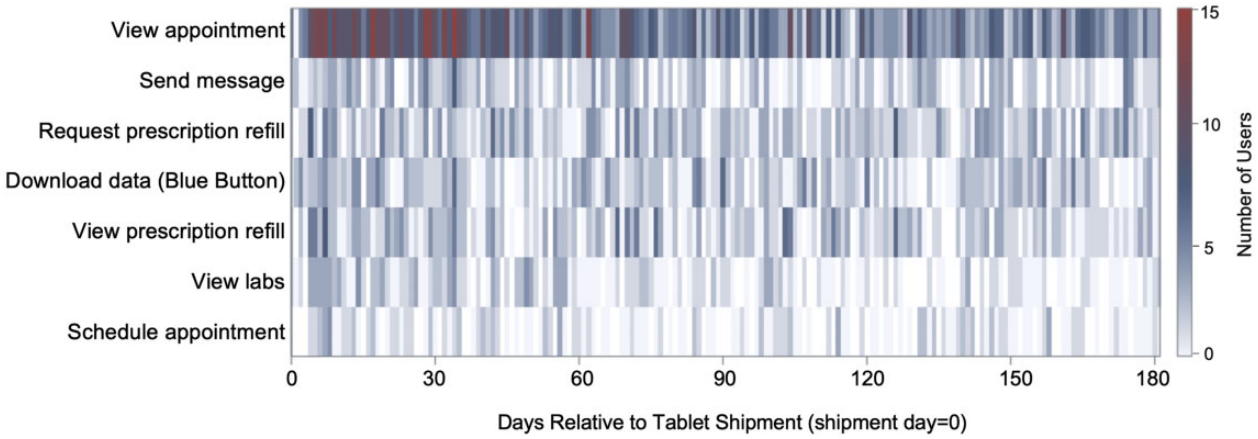

Figure 3. My HealtheVet feature use among baseline portal inactive users after tablet receipt ($n = 525$).

tion and device ownership,[44] so offering these Internet-connected tablets provides an opportunity for these individuals to benefit from virtual care tools.

We also observed several temporal trends in portal use post-tablet and post-registration. Across all user groups, MHV was most commonly used during the first month post-tablet and post-registration. Notably, most new registrants engaged with MHV on the same day of registration. The high initial engagement among new registrants may indicate that once patients get through the registration and authentication process, many can successfully perform health management tasks in the portal. Furthermore, we found that active users, who were already using the portal before receiving a tablet, increased their use of all features post-tablet. This suggests that the MHV icon on the tablet home screen may offer more convenient access. MHV is a web-based portal that patients typically access by opening a browser via a computer or mobile-optimized version of the website, although it can be bookmarked on a personal device.[45] Prior studies have also demonstrated how mobile-accessible portals support increased convenience and use.[46–48]

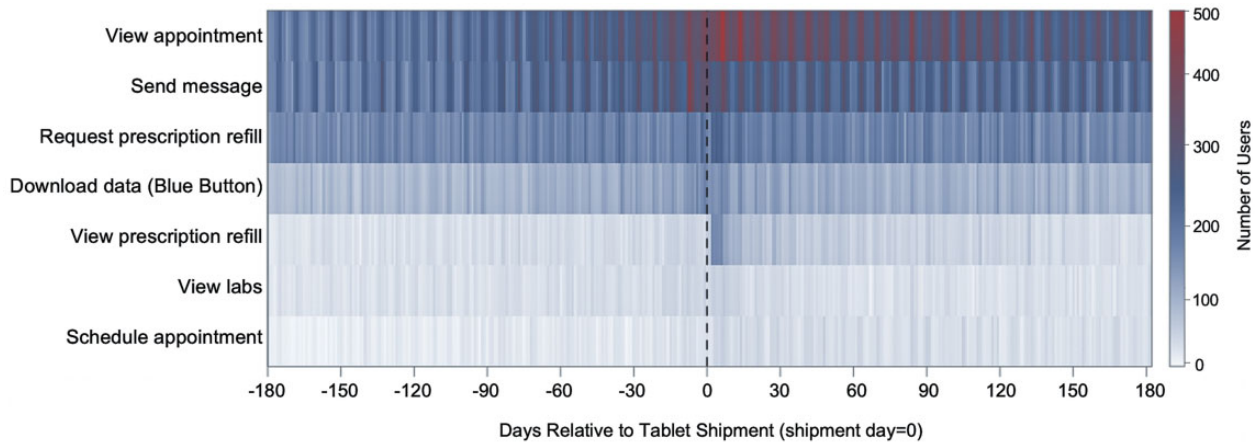

Figure 4. My Health*e*Vet feature use among baseline active users before and after tablet receipt ($n = 9171$).

Table 2. Differences in number of individuals using My Health*e*Vet features in the 6 months before and after tablet receipt[a]

Utilization, *n* (%)	6 months pre-tablet ($n = 7783$)	6 months post-tablet ($n = 7783$)	Difference
View prescription refills	1763 (22.7)	2867 (36.9)	1104 (14.2)**
Schedule appointments	1802 (23.1)	2533 (32.5)	731 (9.4)**
View appointments	5323 (68.4)	5714 (73.4)	391 (5.0)**
Request prescription refills	5324 (68.4)	5617 (72.1)	293 (3.7)**
Download data	3041 (39.1)	3190 (41.0)	149 (1.9)*
Send message	4304 (55.3)	4432 (56.9)	128 (1.6)**
View labs	2026 (26.0)	2101 (27.0)	75 (1.0)

Note:
*$P < .05$, **$P < .01$.
[a]Data are based on active My Health*e*Vet users who registered prior to the 6 months pre-tablet.

Implications for health care practice and research

This study has several implications for health systems considering portal-related interventions for patients with barriers to in-person care. As adopting a new technology is complex and often requires further support beyond receiving access, providing portal education and assistance with registration during the tablet setup process may be valuable. The VA could consider adding MHV support when a patient first receives a tablet. This approach is aligned with prior outreach strategies that have demonstrated increased portal registration and use of certain features following step-by-step tutorials, at home videos, or in-person training.[29,49,50] For example, training veterans to download and share their continuity of care document using the Blue Button feature increased the proportion of veterans sharing their health summary with community non-VA providers.[50] Training efforts are particularly beneficial for older adults as they generally lag behind younger adults in adopting new technologies.[51,52] To meet veterans' technology support needs, VA facilities have MHV coordinators who provide educational material and training to patients and staff. In 2015, the VA launched Virtual Health Resource Centers at certain medical facilities to provide virtual and on-site technology support for patients and staff.[53] Additional work should examine associations with these efforts and the regional or facility-level variation in portal registration and use.

Our findings revealed that portal usage was highest directly following tablet receipt and registration, so there may be opportunities to employ interventions that encourage more sustained use during this initial engagement period. Simple nudges such as portal-based reminders and notifications have been shown to be important motivators for patients to view notes and receive preventative health services.[54,55] Care team endorsement of the portal is also highly valued by patients, and proactive portal messaging initiated by the care team has demonstrated increased portal use.[56–58] Robinson et al[57] found that proactive messaging from the care team through MHV also increased self-management and self-efficacy among patients with diabetes. Although feature use declined after tablet receipt over time, sending messages remained more consistently used among new registrants, highlighting the value of asynchronous patient–provider communication. Leveraging prior use patterns may be valuable to develop specific interventions and outcome measures, including registration among non-users and re-engagement among inactive users. Additional targeted portal interventions for patients with complex clinical and social needs could involve enhancing social support features, collaborative resources, and addressing health literacy barriers.[8,59–62] Nevertheless, not all patients may be able to or desire to utilize portals, and examining preferred modalities for engaging in health information and communication is critical to prevent widening the digital divide.

Limitations

This study had a few limitations to acknowledge. First, the retrospective nature of the study prevents causal relationships between tablet receipt and portal adoption or use. We also opted not to

match tablet recipients to non-tablet recipients as we lacked a sufficient comparison group who were eligible and did not receive the tablet. This is because most patients who met tablet eligibility criteria (ie, lacked a video-capable device; had a geographic, social, or clinical barrier to in-person care; and had an upcoming VA video appointment) received a tablet. As these criteria are largely unobservable in EHR data, it is very difficult to identify individuals who have similar access barriers. Propensity score methods require sufficient knowledge of the relationships among both unobserved and observed variables, so we elected not to use them and to use a pre/post comparison instead. This limitation highlights the importance of including social and digital determinants of health within EHRs to support use of more robust observational study designs.

Furthermore, we were unable to track if patients had connectivity or technical issues that could have hindered tablet use. However, the VA's Connected Device Support Team calls each patient upon tablet receipt to help setup and troubleshoot connectivity issues. A prior study of tablet recipients found that nearly 70% agreed or strongly agreed that they had enough technical support to use the tablet.[33] Additionally, tablet tracking data are not integrated into CDW in real-time. Thus, it is possible that a small number of patients in our cohort were asked to return their tablet due to non-use but were not excluded because this was not yet indicated in CDW. At the time this study was conducted, all veterans who returned their tablet were excluded from the cohort. In addition, this analysis occurred between 2020 and 2021 during the COVID-19 pandemic, so patterns may have been influenced by factors related to the pandemic, such as communication related to COVID-19 symptoms, tests, and vaccines. To our knowledge, there were no systemwide COVID-19 triage processes that occurred within MHV (eg, pre-visit symptom questionnaires or screening processes). Finally, this study focused on portal utilization outcomes, and our future work will examine the impact of portal engagement on clinical outcomes.

CONCLUSION

Among patients who face complex clinical and social needs, receiving a tablet pre-installed with a portal was associated with increased portal usage, particularly for those who had already registered and used the portal. As only a small percentage of patients registered for the portal post-tablet, supplementary training and support efforts may be needed to promote adoption. Patient-level differences in portal registration and use post-tablet receipt suggest that some subgroups may benefit from targeted support. In the growing virtual health care landscape, additional investigation should examine the cost-effectiveness of distributing video- and portal-enabled devices and their impact on management of chronic diseases.

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AUTHOR CONTRIBUTIONS

All authors contributed to the study design, manuscript writing, and revision. ACG was primarily responsible for the analyses and initial draft of the manuscript. All authors reviewed, edited, and approved the final version.

SUPPLEMENTARY MATERIAL

Supplementary material is available at *Journal of the American Medical Informatics Association* online.

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CONFLICT OF INTEREST STATEMENT

None declared.

VA DISCLAIMER

The views expressed are those of the authors and not necessarily those of the Department of Veterans Affairs or those of the US government.

DATA AVAILABILITY

The data underlying this article cannot be shared publicly due to the Department of Veterans Affairs policy on sharing patient data (eg, for the privacy of individuals who participated in the study).

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