Baseline eHealth Behaviors of Service Members: A Retrospective, Cross-Sectional Analysis of Patient Portal Use Before the Pandemic

Major Stephanie J. Raps, USAF, NC, PhD MSN, RN-BC*; Dechang Chen, PhD†; Suzanne Bakken, PhD, RN, FAAN, FACMI⊙‡; Jesus Caban, PhD§; Mary B. Engler, PhD, RN, MS, FAHA‖

ABSTRACT

Introduction:
The use of electronic health (eHealth) tools has the potential to support the overall health, wellness, fitness status, and ability to deploy worldwide of active duty service members (SMs). Additionally, the Coronavirus Disease 2019 pandemic forced healthcare organizations to quickly convert to virtual care settings to decrease face-to-face interactions and increase access to healthcare using technology. The shift to virtual care and the push to increase use of eHealth tools heightened the need to understand how military members interact with eHealth tools. Little is known about the factors that influence SMs use of eHealth tools and if having a health condition increases or decreases use. To evaluate these factors, we completed a cross-sectional, retrospective analysis on a sample of 198,388 active duty SMs aged 18 to 68 years.

Materials and Methods:
We used two Military Health System (MHS) data sources—Tricare Online (TOL) Patient Portal 2018 audit logs and outpatient electronic health record data. Using eHealth behaviors identified in the audit logs, we evaluated and compared individual characteristics (i.e., "gender", "age", "race", and "marital status"), environmental factors (i.e., "rank", "military branch", and "geographic location"), and six available health conditions (i.e., congenital health defects, amputation, anxiety, sleep, traumatic brain injury, and depression). Since moderate usage of eHealth tools is linked to improved health outcomes, adherence, communication, and increased consumer satisfaction, a logistic regression model was developed to find the factors most associated with moderate (3–11 logins per year) use of the portal.

Results:
Electronic health use increased by SMs with underlying health conditions or if they were managing family member health. Most SMs who used the TOL Patient Portal were of ages 25-34 years, White, and married. The mean age is 32.53 for males and 29.98 for females. Over half of the TOL Patient Portal SM users utilized the portal one to two times. Most SMs used the TOL Patient Portal in Virginia, Texas, California, Florida, North Carolina, Georgia, and Maryland. The highest use was during the months of March to May. Frequent patient portal actions include searching for appointments, viewing health information, viewing medical encounters, and refilling medications. Although SMs with congenital health defects, anxiety, sleep issues, and depression have higher patient portal use rates, SMs with depression have a negative association with using the patient portal at a "moderate" rate. Viewing family member health information and searching for appointments were strongly associated with patient portal moderate use.

Conclusions:
Our findings support top military initiatives to improve the overall health, wellness, and readiness of SMs while decreasing the MHS's overall cost of care while providing a foundation to compare "pre" and "post" pandemic eHealth behaviors. It is essential to note that SMs are more likely to use a patient portal to seek information or manage family member health. This key factor identifies the significance of family health promotion and readiness in the active duty SM's life. The long-term goal of our study is to build the foundation for delivering tailored health information and eHealth tools to promote health and readiness-centric patient engagement.

*Science and Technology, 59th Medical Group, Lackland, TX 78236, USA

†School of Medicine, Preventive Medicine and Biostatistics, Uniformed Services University, Bethesda, MD 20814, USA

‡Columbia University School of Nursing, New York, NY 10032, USA

§Clinical & Research Informatics, National Intrepid Center of Excellence, Bethesda, MD 20814, USA

‖Graduate School of Nursing, Ph.D in Nursing Science Program, Uniformed Services University, Bethesda, MD 20814, USA

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INTRODUCTION

Medical readiness of active duty service members (SMs) is a vital objective of the Defense Health Agency, the U.S. Combat Support Agency that oversees the Military Health System (MHS).[1] The use of electronic health (eHealth) tools

has the potential to support improved medical readiness or the overall health, wellness, and fitness status of active duty SMs and their ability to deploy worldwide. As the Coronavirus Disease 2019, or COVID-19, began to alter day-to-day interactions of individuals and organizations, the MHS continued to seek opportunities to provide safe, reliable care and expand access to care. Coronavirus Disease 2019 forced healthcare organizations, like the MHS, to quickly convert to virtual care settings to decrease face-to-face interactions and increase access to healthcare using technology. The shift to virtual care and the push to increase use of eHealth tools heightened the need to understand how military members are interacting with eHealth tools and what factors increase or decrease utilization.

Several eHealth tools have been released in primary care clinics over the last decade. TriCare Online (TOL) Patient Portal, available since 2010, is one eHealth solution the MHS uses to facilitate Internet-based access to health information and health management resources. Due to the recent implementation of a new electronic health record (EHR) in the MHS and upgrades in current patient portal tools, our study focused on the long-standing TOL Patient Portal to provide a baseline view of characteristics of SMs who use a patient portal. Previous researchers discovered that patient portals enhance continuity of care and health management behaviors,[2] two key factors that support medical readiness. Despite high interest from consumers and the overall growth of eHealth tools, widespread adoption remains low.[3,4] Only 15% of active duty SMs used the TOL Patient Portal between 2017 and 2019.[5] Due to SMs being an overall healthy population, many MHS healthcare providers anecdotally believe that SMs use patient portals significantly lower than the general population who use eHealth resources for health tracking and seeking information about healthy eating, weight loss, and self-treatment versus management of ongoing medical conditions. Moderate and sustained use of eHealth tools, like patient portals, is linked to improved health outcomes,[6,7] adherence to treatment,[8] better-quality consumer–provider communication,[9] and increased consumer satisfaction[7] in the general population and in consumers managing diseases, i.e., diabetes and hypertension. However, little is known about the characteristics and behaviors of SMs who use a patient portal and if having a health condition increases or decreases these behaviors.

In this study, eHealth behavior is defined as the use of Internet or mobile tools for health purposes that include online health information-seeking, online communication with clinical teams, and use of health management applications such as patient portals.[10] Common eHealth behaviors fall into two categories: Online health information-seeking and online health management. Health information-seeking behaviors are deliberate efforts to acquire health-related information.[11] Health management is the intentional action to care for oneself and maintain overall health or a health condition.[12] Based on Longo's (2005) health information-seeking theory, the eHealth Behaviors Model (see Fig. 1) was adapted to illustrate
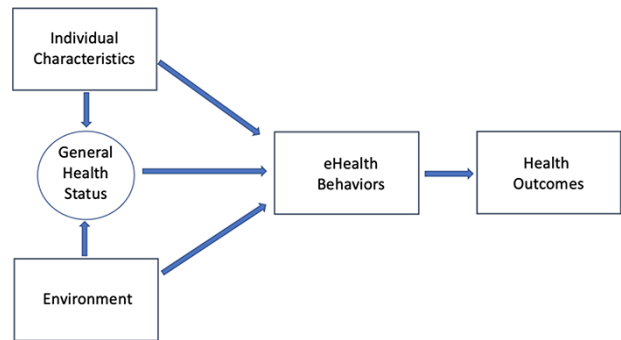

FIGURE 1. eHealth behaviors model.

the predisposing individual characteristic, environmental, and health status variables that influence eHealth behaviors and health outcomes.

Researchers identified various individual characteristics or factors in previous studies, including age, gender, education, socioeconomic status, and health status that influence the frequency and use of eHealth tools.[11] Environmental factors also influence consumer behaviors and how they access health information including Internet access (e.g., home or public access, speed of Internet), available technology (e.g., computer or smartphone), geographic location, and community (e.g., rural, metropolitan). Women with a higher level of education have a long-standing association with seeking health information online and increased use of eHealth tools.[13,14] Age also influences the source (i.e., online versus paper or person to person) used to seek health information. Many researchers report consumers above age 60 utilize the Internet less frequently as a health information and management source than younger consumers.[13] Additionally, studies show that married consumers or consumers with a long-time partner have a higher frequency of seeking health information online.[15–17]

Race and ethnicity are important factors associated with utilizing eHealth resources. Consumers who identify as African American and White have the highest frequency of health information seeking.[17–19] Hispanic ethnicity is generally the least associated with utilizing the Internet for health information.[20,21] Geographic location is also related to the frequency of seeking health information online. African Americans, Whites, and Hispanics living in rural locations with Internet access, report lower health information-seeking levels than those in metropolitan areas.[22]

A majority of the U.S. population has access to the Internet; 93% of adults disclosed utilizing the Internet in their daily lives.[23] Internet access and technology continue to be a primary factor in using eHealth resources. The standard barriers to eHealth are limited Internet access, low eHealth literacy, and the lack of consumer awareness of eHealth technology.[7,24] Significantly higher rates of using an eHealth resource, like a patient portal, are associated with access to the Internet at home, a higher reported capability to use

the Internet, and going online frequently.[15] Furthermore, researchers have found that 75.1% of adults utilize the Internet to search for health information[25] and 63% of adults access the Internet as an initial resource for health information.[26] Active duty SMs report spending over 6 hours per week searching for various health information topics at home and 4.2 hours in the deployed setting.[27]

Researchers have completed multiple studies on the use of eHealth tools in the "retired" military population.[2,15,28] However, the retired military member no longer has the requirement to maintain medical readiness, limiting the relevance of these study findings in the SM population. Few studies have been conducted to evaluate the use of a patient portal in the active duty SM population and the characteristics and eHealth behaviors associated with moderate usage. Although some studies have been completed to identify attitudes, beliefs, and preferences when using eHealth tools,[29,30] most of these studies had limited active duty SMs in their samples. Our study aimed to identify the factors that influence SM use of eHealth tools and if having a health condition increases or decreases use. Before completing the study, approval from the USU Institutional Review Board was obtained. The study was considered exempt.

MATERIALS AND METHODS

We conducted a retrospective, cross-sectional analysis of patient portal utilization by SMs who used the patient portal in 2018—focusing on eHealth behaviors, namely, individual characteristics, environmental factors, and six available health conditions. We developed our dependent variables by utilizing acquired data from the TOL Patient Portal audit logs. Audit logs record all interactions or events performed within the system and when they happened.[31] The eHealth Behaviors Model and results from prior literature guided our selection of individual characteristics and environmental factors.

Data Sources & Sample

Data sources included the TOL Patient Portal 2018 audit logs and limited MHS EHR data available under a standing data sharing agreement with the National Intrepid Center of Excellence (NICoE) Informatics Department that supported our study. The final sample included 198,388 SMs between ages18 and 68 from the Army, Air Force, Navy, and Marines service branches (see Fig. S1).

Data Preparation

The TOL Patient Portal generates and collects a large number of data elements in the system audit logs. We obtained the data dictionary to understand the various data elements. Our initial analysis included all consumers who used the patient portal between 2017 and 2019. Inconsistencies were noted in the data (see Fig. S2), and it was discovered due to various system updates (i.e., new features added, different naming conventions) that 2018 provided the most consistent data for evaluation.

After TOL Patient Portal data elements were selected, we combined them with the EHR data to add demographic information and six available health conditions. Previous researchers identified various individual characteristics or factors that influence the utilization of eHealth tools including age, gender, education, socioeconomic status, and health status. We selected the following available demographics: Gender, race, age, marital status, rank, military branch, and geographic location. We selected rank and military branch to represent education and socioeconomic status. Geographic location was assessed to evaluate if the location of the Military Treatment Facility (MTF) influenced patient portal utilization.

The health conditions in the (NICoE) Informatics Department dataset were limited, so we selected all available health conditions that linked with our final 2018 SM sample. Only six health conditions were available for this analysis. We used the International Classification of Disease (ICD-10) codes from the EHR to add the following health conditions: Congenital health defects (CHD), amputation, anxiety, sleep, traumatic brain injury (TBI), and depression.

We used the TOL Patient Portal audit logs to identify the following eHealth behaviors: Booking appointments, canceled appointments, searching for appointments, viewing health information, viewing family member information, viewing medical encounters, saving/printing information, MTF transfer request, and medication refill. After reviewing these eHealth behavior data elements, we created the following variables for analysis.

1. **Actions Per Year:** The total number of actions completed on the TOL Patient Portal by the SM each year.
2. **Logins Per Year:** The total number of SM logins per year differs from the total number of actions per year. For example, a user may complete four actions on a single date, or a user may complete two actions on two different dates. The first user would count as one login per year, and the second would count as two logins per year (see Fig. S3). We assumed that the user only logged in one time per day for this analysis.

Analysis

Using the eHealth Behaviors Model as a guide, we examined "Individual Characteristic" variables (gender, age, race, and marital status), "Environment" variables (rank [proxy for income, education, and socioeconomic], military branch, and geographic location), and "General Health Status" (no health condition or type of health condition). We operationalized eHealth behaviors as type of action, number of actions per year, and number of logins per year. As stated above, researchers have discovered that moderate usage of eHealth tools improves patient health outcomes, adherence, communication, and increased consumer satisfaction. We created the levels of use for our study using a prior study evaluating sustained use of a patient portal.[15] Moderate use, the focus of our study, was defined as three to eleven logins per year.[15] Using

descriptive statistics and frequencies, we compared eHealth behaviors between individual characteristics and environmental factors. We used the results of these comparisons to help determine which variables to use in the logistic regression model. The logistic regression model was employed to assess portal users that logged in at moderate rates or 3 to 11 times. Identifying the characteristics of moderate-level users may help improve engagement by tailoring future design strategies and military leadership initiatives to expand the use of eHealth tools. Before developing our model, the assumptions of linearity, independent errors, and multicollinearity were evaluated. We completed our analysis in SPSS Version 27 and "R" Studio Version 1.3.1073.

RESULTS

Individual Characteristic Results

Individual characteristic variables included gender, age, and marital status. A majority of the TOL Patient Portal users in 2018 were male (71.22%), between the ages of 25 and 34 (43.98%), White (55.7%), and married (72.1%) (see Table I). In 2018, there were 1,082,091 male SMs in the total military population compared to 215,437 females.[32] After viewing the percentage within the total military population, 26.58% of females used the portal compared to 13.00% of male SMs. The mean age of the active duty population is 31.80, and SMs show higher usage in the 24 to 34 age group. Despite most SMs being married, the overall percentage of use is relatively equal between married and single SMs.

Over half of the SMs used the patient portal minimally or one to two times in 2018 (see Table S1). The mean number of logins per year was 3.83, and the mean number of completed actions was 7.14 per year. The top actions completed were searching for appointments (37.65%), viewing family member information (70.26%), viewing personal health information (50.50%), viewing medical encounters (30.43%), and refilling medications (41.59%).

Environment Results

The environment results include describing and comparing eHealth behaviors between rank, geographic location, and military branch. Army (42.75%) and Enlisted (71.38%) members had the highest TOL Patient Portal users. Army is the largest branch, and most military members are enlisted. The Army made up 36.25% of the total active duty population, and 81.44% were Enlisted members. However, the Air Force (22.64%) had the highest population use and only 13.32% of enlisted members used the portal in 2018. We found that the highest use of the TOL Patient Portal was seen between the months of March and May. Service members in Texas, Virginia, California, North Carolina, Florida, Georgia, and Maryland have the most extensive patient portal use. The Southeast Region of the USA has the most SM users (35.92), followed by the West Region (20.34%) and the Southwest Region (17.04%).

TABLE I. Individual Characteristics

Demographic	Frequency	Percentage
Gender		
Male	141,293	71.22
Female	57,095	28.78
Age		
18-24	41,374	20.85
25-34	85,279	43.98
35-44	58,319	29.39
45-54	12,776	6.43
55 ≥	640	0.32
Ethnicity		
American Indian/Alaskan Native	2,319	1.16
Asian or Pacific Islander	12,932	6.51
Black, not Hispanic	36,889	18.59
White, not Hispanic	110,539	55.71
Hispanic	28,156	14.19
Other	6,913	3.48
Unknown	639	0.32
Marital status		
Single	55,267	27.85
Married	143,121	72.14
Military branch		
Army	84,823	42.75
Air Force	73,659	37.12
Navy	31,344	15.79
Marines	8,563	4.31
Military rank		
Cadet	1,227	0.61
Enlisted	142,708	71.38
Officer	51,726	25.63
Warrant Officer	5,412	2.66

General Health Status Results

In the 198,388 SMs sample, 78,366 had one or more of the six health conditions and 120,022 had no diagnosis. Sleep issues were the most common health condition (30.55%), followed by TBIs (12.69%). Depression (5.23%) and anxiety (3.71%) were less common. An amputation or CHD were both under 1% in this population of SMs who used the TOL Patient Portal. The mean number of SMs without a health condition logins per year was 3.07, and the mean number of completed actions was 5.59 per year. There were only slight differences in the number of logins and actions by members with an amputation or TBI. However, mean logins and actions per year increased by members with anxiety (logins [6.99]/actions [13.68]), CHD (logins [6.64]/actions [13.06]) sleep issues (logins [5.31]/actions [10.10]), and depression (logins [6.46]/actions [12.41]). Service members with CHD and anxiety have higher rates of moderate TOL Patient Portal use (see Table II).

Logistic Regression Model Results

A logistic regression model was completed to assess the factors that could predict moderate TOL Patient Portal use in the SM population. First, each independent variable bivariate relationship was tested individually. We then selected

TABLE II. Frequency & Percentage of Health Conditions

Logins by health condition	Frequency	Percentage
CHD		
0-2	246	42.3
3-11	248	42.6
12-23	61	10.5
24+	27	4.6
Amputation		
0-2	14	60.9
3-11	7	30.4
12-23	2	8.7
24+	–	–
Anxiety		
0-2	2,982	40.5
3-11	3,175	43.2
12-23	805	10.9
24+	392	5.3
Sleep		
0-2	29,567	48.8
3-11	24,283	40.1
12-23	4,941	8.2
24+	1,820	3.0
TBI		
0-2	13,554	53.8
3-11	9,281	36.9
12-23	1,728	6.9
24+	613	2.4
Depression		
0-2	4,477	43.1
3-11	4,319	41.6
12-23	*1,108*	*10.7*
24+	473	4.6

Abbreviations: CHD: Congenital health defects; TBI: Traumatic brain injury.

variables identified in previous eHealth behavior literature, descriptive analysis, and the variables with the highest odds ratios from our bivariate results (see Table S2). Specifically, these variables include health condition, gender, age, race, marital status, service branch, eHealth behavior, and action type.

In addition, we considered geographic location and rank. Although prior studies found geographic location was not a factor, military members frequently move, making geographic location a possible predictor of moderate portal utilization. Rank was added because it is the best representation of income and education in this dataset and a common predictor from previous literature. The final logistic regression model used the following variables (see Table III): Gender, age, depression, booking or searching for appointments, viewing family members or personal.

The logistic regression model results indicate that the two strongest predictors of moderate TOL Patient Portal use were viewing family member health information, recording an odds ratio of 5.83, and searching for appointments (OR = 3.21). Female SMs were 20.00% more likely to log in at a moderate rate than male members. Moderate utilization increases slightly as SMs increase in age. Service members with depression are negatively associated with using the patient portal at a moderate rate, meaning a 16.70% decrease in odds of using the portal at a moderate rate.

DISCUSSION

The current study utilized patient portal data to operationalize the concepts of eHealth behaviors and expand the understanding of these behaviors in the active duty SM population. Additionally, our study evaluates pre-pandemic data and the information uncovered provides foundational data for further investigation and refinement of eHealth tools. The pandemic highlighted the critical need to interface with patients thorough innovative means such as eHealth tools. Initial evaluation of the frequency of TOL Patient Portal users in 2018 found that most users were male, between the ages of 25 and 34, White, and married. Our study highlights how the frequency of eHealth tool use in a population can be misleading. It appears that in the SM population, more males use the patient portal, but with further investigation of the general population, the total female population used the portal more compared to males. This is more consistent with previous literature identifying users as mainly White,[33] female,[25,26] and married.[33] Females also log into the TOL Patient Portal and complete more actions than males. Military commanders should be aware of these gender differences when evaluating initiatives or major events impacting healthcare, such as the recent major upgrade to MHS GENESIS EHR and the increase of health information technology utilization during the pandemic.

When comparing race in the SM population, only 55.71% of the users were White, non-Hispanic. In a sample of 36,214 survey respondents, Gonzalez, Sanders-Jackson, Wright[33] found that 80.36% of the study's sample was White. African Americans had the lowest portal use rate in the retired military population after initial registration.[2] The current study found more diverse level of patient portal users, compared to the general population: Black 18.59%, Hispanic, non-White 14.19%, Asian or Pacific Islander 6.51%, and American Indian or Alaskan Native 1.16%. Like the general population, geographic location did not significantly influence patient portal use. However, the highest frequencies were found in Virginia, Texas, California, Florida, North Carolina, Georgia, and Maryland. These locations have large medical centers and military populations, which most likely account for the higher use. No other known studies on the general population evaluated the highest usage by month. In the SM population, the highest patient portal use was during the months of March to May. Future studies could determine the cause of this increase. An anecdotal reason for the increase is that military members move at higher rates during these months and may seek health services before their move. Although our study evaluates pre-pandemic data from 2018, the information uncovered continues to be useful as eHealth, and virtual health capabilities evolve in the MHS to include expansion of

TABLE III. Predicting the Likelihood of TOL Patient Portal Moderate Use

Variable	B	SE	Wald	df	Sig.	Exp(B)	95% CI for Exp(B)	
							Lower	Upper
Gender (F)	0.183	0.013	208.326	1	0.000	1.2	1.171	1.23
Age	0.006	0.001	75.2	1	0.000	1.006	1.005	1.008
Depression	−0.182	0.025	52.618	1	0.000	0.833	0.793	0.867
Booked appointment	0.543	0.016	1131.587	1	0.000	1.722	1.668	1.777
Searcher for appointment	1.166	0.012	8993.243	1	0.000	3.211	3.134	3.289
Viewed family health information	1.764	0.015	13,102.811	1	0.000	5.834	5.661	6.013
Viewed personal health information	0.960	0.013	5641.361	1	0.000	2.612	2.547	2.678
Viewed encounter notes	0.14	0.013	108.363	1	0.000	1.151	1.121	1.182
Refilled medication	1.061	0.012	7766.018	1	0.000	2.889	2.822	2.958
Constant	−3.865	0.029	17,990.763	1	0.000	0.021	–	–

Moderate use equals 3-11 logins per year.

synchronous virtual appointments, health promotion applications, and increased use of secure messaging.

The retired military population has slightly higher patient portal enrollment rates, around 21%[2] compared to 15% of SMs between 2017 and 2019.[5] The top used features in the retired military population were medication refills, viewing appointments, secure messaging, and downloading their health history.[2] In the SM population, very few users saved or downloaded their information, but, like the retired population, the most frequently used features were searching for appointments and refilling medications. Service members have a very high rate of viewing family member and personal health information. Service members often live long distances from family and have limited support systems, which may account for the importance of maintaining family health and wellness. The use of eHealth tools improves the relationship with healthcare teams by preparing consumers for appointments and reviewing laboratory results.[34]

Additionally, being female, having at least one health condition, and sleep issues had the most significant difference in mean use by login and actions per year compared to all other TOL Patient Portal Users in 2018. The last critical discovery is that female SMs use the patient portal at a moderate rate more frequently than males. The strongest predictors of moderate TOL Patient Portal use were viewing family member health information and searching for an appointment. Military healthcare teams should also know that SMs have a high propensity to seek and view family member health information and use the patient portal most to search for appointments, refill medication, and seek health information. Managing the health of military family members over multiple moves, transitions to new school districts, and deployments can be daunting. The information discovered in our study identifies patient portals as a valuable resource for the SM's medical readiness and, also, the health management of military family members.

The results of our study indicate that the overall number of logins and actions per year increases if the SM has a health condition—over 40% more depending on the type of health condition. Service members with depression are negatively associated with using the patient portal at a moderate rate. This is different in the retired military population, where researchers identified that members with severe depression were more likely to engage with the patient portal.[2] In the active duty SM population, mental health concerns or issues may not be proactively addressed for fear of resultant duty limitation or military discharge. We initially hypothesized that the anonymity of using an eHealth tool might help overcome the stigma of seeking mental health services. It is possible SMs with depression may withdraw from eHealth platforms as well as interpersonal engagement. These findings highlight the need for more research in this population.

Some considerations and limitations regarding the data and methodology should be acknowledged. The central assumption identified while completing this study was that SM's use of the TOL Patient Portal represents a component of their eHealth behavior. The ability to use eHealth tools includes access to the Internet and a computer or smartphone. We could not determine the usability (i.e., efficiency of use by an individual) of the patient portal when evaluating our data. Examples include ability to access the system, time spent on each patient portal feature or page, and completion of expected tasks. We also assumed that SMs have adequate access to MHS's eHealth tools due to the requirement for SMs to be accessible 24 hours a day, 7 days a week (i.e., most SMs have a cell or smartphone). However, similar disparities (e.g., health literacy and lack of broadband Internet) found in the general population may also appear in this population. It is also important to remember that the information collected from eHealth applications is intended to support clinical, administrative, and financial purposes. In addition, only six general health conditions were available to evaluate how having a health condition may increase or decrease eHealth behaviors of SMs who use a patient portal.

Our study expands the knowledge of the common factors that influence SM eHealth behaviors, which are critical as

the Defense Health Agency shifts to a new EHR and health system structure. This study also fills the gap in MHS knowledge past implementation and initial adoption research and can be influential to policy that develops more tailored eHealth tools in support of coordination of care. Researchers evaluating retired military populations have discovered that participants felt coordination of care between non-VA providers improved.[35] Military members relocate every 2-4 years, making care coordination vital. The new knowledge gained in this study may be beneficial in expanding eHealth use and support SMs meeting military medical requirements. Moreover, the study results may contribute to broader eHealth research by expanding the military relevance with eHealth and its various implications and barriers.

CONCLUSION

The results of this retrospective cross-sectional analysis on a sample of 198,388 SMs aged 18 to 68 contribute to the knowledge needed for future design strategies and policy updates that can improve the perceptions of eHealth. Specifically, our study identifies increased eHealth use if the SM has an underlying health condition or uses the portal to manage family member health. This type of pre-pandemic eHealth behavior will be used in a future study comparing military eHealth behaviors post-pandemic. Most importantly, our study provides a foundation to evaluate how the pandemic influenced eHealth behaviors. Replication of this study is feasible, since our study methodology provides a scalable and time-saving strategy to evaluate eHealth applications. Data collected on consumers from EHRs, clinical data repositories, and other eHealth applications, such as the TOL Patient Portal, can accelerate translational science to create actionable healthcare information. Big data analytics help researchers harness such health-related data into knowledge and determine patterns, trends, and associations to develop actionable healthcare information and even precision health.[36] Most importantly, this knowledge may support top military initiatives to improve the overall health, wellness, and readiness of SMs while decreasing the MHS's overall cost of care. The long-term goal of this study is to build knowledge that provides the foundation for delivering tailored health information and more appealing eHealth tools to promote health and readiness-centric patient engagement.

SUPPLEMENTARY MATERIAL

Supplementary material is available at *Military Medicine* online.

CONFLICT OF INTEREST STATEMENT

None declared.

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