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Integrating the Telequit Smoking Cessation Program in the Admission Process and Analyzing Its Effect on the Rate of Utilization by Homeless Veterans Within a Federal Healthcare Facility

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N595C Translating Evidence into Reflective Practice III

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Author Note

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The Centers for Disease Control and Prevention (CDC) estimates that approximately 34 million American adults smoked cigarettes in 2019. While cigarette smoking reached an all-time low in 2018, affecting 13.7% of US adults, the prevalence of cigarette smoking among veterans was 21.6% or 58.6% higher than among the general population (Brown, 2009; Creamer et al., 2019; Odani et al., 2018). However, little is known about the prevalence rate of cigarette smoking among homeless veterans. Values may be higher than the estimated for veterans, considering that the national homeless population's smoking rate has remained at 80% (Baggett & Rigotti, 2010; Tsai & Rosenheck, 2012).

The adverse health and economic consequences of cigarette smoking on military veterans of the United States are substantial. The financial burden of cigarette use includes considerable health care costs to treat smoking-related diseases, including cancer and respiratory and vascular diseases (Jha et al., 2013). According to the CDC, smoking-related diseases cost over $300 billion per year, with smoking being the leading cause of preventable death (2014). In addition, the Veterans Health Administration (VHA) arm of the Department of Veterans Affairs (VA) spends billions of dollars per year on smoking-related health services (Barnett et al., 2014; 2017).

Homeless Veterans and Tobacco Use

Historically, cigarette smoking has been associated with the military culture; cigarettes used to be included in soldiers' rations and sold tax-free to military commissaries (Joseph et al., 2005). The ongoing tobacco use among veterans has been perceived, in part, as a legacy of this

association. However, the challenge of cigarette dependency among homeless veterans is further complicated by problems commonly associated with homelessness, such as post-traumatic stress disorder, traumatic brain injury, and substance use disorder (Applied Survey Research, 2020; Shealy & Winn, 2014).

As a result of this increased risk, there is a significant need to increase the enrollment of homeless veterans in smoking cessation programs. A unique opportunity to provide education and treatment for this issue surfaces when homeless veterans seek care for other problems. However, such comprehensive medical care is challenging due to the transient nature of homelessness. Effective referrals and follow-ups are frequently impossible (Davies & Wood, 2018).

Telequit Effectiveness and Theoretical Framework

Methods of Smoking Cessation

Lindson et al. (2021) have outlined methods to enhance the delivery and effectiveness of stop-smoking assistance in primary care. More individuals quit smoking for at least six months when extra counseling, free nicotine replacement therapy, and personalized printed materials were included to assist with smoking cessation. Less specific methods, such as providing individuals feedback on health risk indicators, educating healthcare professionals, or compensating the professionals for offering quit-smoking assistance, might encourage more people to quit. Miller and Wood (2003) also found comparable results in a systematic review based on well-designed Randomized Controlled Trials (RCTs). Overall, top-tiered behavioral, clinical, and pharmacological interventions support the use of printed materials, state-sponsored smoking cessation telephone quit-lines, brief cessation advice, telephone counseling, group therapy, and medications for smoking cessation (Miller & Wood, 2003).

State Smoking Quitline and Telequit Effectiveness

Telequit is a smoking cessation care coordination program serving VA veterans and employees in Northern California and Western Nevada (VA Palo Alto Healthcare System [VAPAHCS], n.d.). The program consists of a one-on-one tele-counseling that provides education and nicotine replacement therapy.

The rehabilitative possibilities of telephone support for smokers continue to be a focus of research. For example, a study examined 104 randomized or experimental trials and found that smokers using a helpline had higher quit rates (Matkin et al., 2019). Ideally, telephone counseling should be coupled with an intervention from a health care provider for increased effectiveness. Conversely, the patient may be referred for a Telequit hotline consultation after the health care provider presents the initial medical intervention, further contributing with necessary telephone support and reinforcing the veteran's treatment.

Several studies support the effectiveness of smoking cessation telephone quitlines. For instance, a study of the Telequit system reported that when medical interventions were coordinated with a state smoking quitline, the abstinence rates, quit rates, and medication adherence increased (Sherman et al., 2017). A cluster-randomized trial involving 23 primary care clinics in two different healthcare systems, compared e-referral with fax-based referral of outpatient adults to a tobacco treatment quitline and reported that the e-referral strategy increased quitline adherence three to four times more than the paper fax referral (Fiore et al., 2019).

The Telequit program has yielded a 27% six-month abstinence rate among the 19,000 veterans who participated in the program since its inception in 2007 (VAPAHCS, n.d.). However, while the evidence supports the use of the Telequit program, this resource is only available if the medical provider refers the veteran for a consultation.

RE-AIM Framework

The Reach, Effectiveness, Adoption, Implementation, and Maintenance (RE-AIM) framework for planning and evaluation has been used to review various health promotion and disease management interventions (Glasgow et al., 2019) and is one of the most frequently applied implementation frameworks. Glasgow's seminal 1999 introductory paper has been cited over 2,800 times in over 450 journals (Glasgow et al., 2019). Notably, the framework has been widely used nationally and internationally across many populations and health conditions (Shoup et al., 2014). RE-AIM continues to evolve and has been used to translate research into practice and help health care programs produce a balanced approach to obtain internal and external validity. The framework has also been used to understand the relative strengths and weaknesses of different approaches to promoting health and managing chronic disease (What is RE-AIM, n.d.).

The application and reporting of the RE-AIM dimensions in published literature from 1999 to 2010 have been described in a systematic review of the use of the RE-AIM framework, explaining how RE-AIM was applied in areas including physical activity and obesity, disease management, tobacco or substance abuse, mental health, cancer prevention, and numerous other topics (Gaglio et al., 2013). Over time, RE-AIM has been increasingly applied to broader areas, which include healthcare policy, community-based multilevel interventions, and the reduction of health disparities. RE-AIM has evolved from evaluating health behavior research to its application in planning stages, assessing progress, reporting outcomes, and reviewing the literature. As an outcome framework, investigators can include all or selected dimensions within a given study, although the nature of many proposed interventions may limit the number of

dimensions that can be effectively examined. Gaglio et al. (2013) highlighted that the more the RE-AIM issues that are reported across the five dimensions, the more valuable the RE-AIM would be in producing results that positively impact public health.

Purpose of this Study

The use of telehealth for smoking cessation has not been consistently applied and evaluated within the hospital admission process despite the supporting evidence. Likewise, telehealth interventions have not been evaluated in the context of the Reach, Effectiveness, Adoption, Implementation, and Maintenance (RE-AIM) framework. This quasi-experimental quality improvement study of two groups seeks to fill this gap by investigating the effectiveness of integrating a Telequit smoking cessation protocol for homeless veterans into the hospital admission process. The findings are expected to support incorporating Telequit e-consults into the patient admission template within the federal healthcare inpatient residential program. Currently, the Telequit consult is not offered in the admission questionnaire, which may lead to missed opportunities of offering Telequit to incoming residential patients.

It is hypothesized that by incorporating the Telequit referral in the admission process, more veterans would be enrolled in the Telequit program. The null hypothesis is that it will not impact referral and engagement.

Methods

Setting and Participants

The study's sample was composed of homeless veterans participating in a six-month residential treatment. The study was conducted at a 100-bed Domiciliary unit, which was limited to 41-beds due to pandemic restrictions. The treatment team included two Doctors of Medicine, four nurse practitioners, six registered nurses, one nurse manager, one assistant nurse manager,

eight licensed vocational nurses, ten health technicians, four addiction therapists, three peer support specialists, four social workers, and five psychologists.

Data

The electronic health records available in the Computerized Patient Record System (CPRS; the federal proprietary electronic health record) were reviewed for all patients 18 years old and over that were admitted. Patients met inclusion criteria if they were veterans and homeless referred to the Telequit program by a primary care provider.

The pre-intervention group included records from March 1, 2019 to October 31, 2019, while the post-intervention group included veterans admitted from March 1, 2021 to October 31, 2021. Health records were collected seven months before and after the intervention. Table 1 outlines the measures proposed for each RE-AIM dimension evaluated.

Procedure

Planning and Training

The investigator introduced the project and protocols through staff-wide morning meetings and unit-wide email distributions (see Appendix B). The protocols provided the details concerning the new clinical workflow and the steps that needed to be followed for providers to refer a patient to the Telequit program (see Appendix C). In addition, the investigator gave a presentation on the proposal during a weekly medical/psychiatric meeting and followed up weekly for additional questions. Furthermore, the investigator presented a lecture to the nursing staff during a monthly meeting (see Appendix D). Nurses also encouraged reluctant veterans to reconsider smoking cessation in their weekly health classes and referred them to the project's website (see Appendix E).

The investigator contacted the Program Manager of the Telequit Smoking Cessation Program, Pulmonary & Critical Care Medicine, and a data champion to submit data inquiries for the pre-intervention and post-intervention periods through the Office of Business Analytics. A manual review of the CPRS admission also supplemented data collection during pre-and post-intervention periods.

Informed Consent

The access to the patients' health profiles was limited to health care providers. Names were excluded to protect veterans' identities, although the CPRS records of admissions to the homeless program were consulted to gather data. There were no monetary costs or benefits to the veterans during this investigation. However, the intervention could potentially increase enrollment in the Telequit program, reducing the costs associated with smoking. The medical information of the veterans receiving treatment at the federal healthcare facility is protected under HIPAA laws and regulations and stored in a secure location. This study did not collect or analyze data containing patient identifiers; therefore, patient charts were not identifiable. Finally, patients were not compensated for their participation.

Analysis

Data analysis included descriptive and inferential analysis. True population rates were compared using statistical hypothesis tests. The tests for equality of true population rates are based on Fisher's Exact Probability Test. A p-value lower than 0.05 was deemed statistically significant, while a p-value greater than 0.05 was not statistically significant. The seven providers of referrals were identified with the letters A through G to facilitate description.

Results

Participants

A total of 116 veterans were included in this study, being 69 veterans in the pre-intervention group and 47 veterans in the post-intervention group. A total of 71% of the pre-intervention group and 74% of the post-intervention were cigarette smokers, and 44% of the smokers in the pre-intervention group were referred to Telequit, while only 18% were referred in the post-intervention group. More smokers in the pre-intervention group (70%) had previous experience with Telequit than smokers in the post-intervention group (53%). A total of 88% of the smokers who had previous experience with the Telequit program among the pre-intervention group were not active participants within the program, while 44% of the post-intervention group were not active participants at the time of their admission. The pre-intervention group was composed mainly of males (96%) who self-identified as Caucasians (55%), African Americans (22%), Hispanics (20%), and Asians (3%). The average age of smokers was 54 years and of nonsmokers was 52 years. The post-intervention group was mainly composed of males (100%) and self-identified as Hispanics (47%), African Americans (26%), Caucasians (23%), and Asians (4%). The average age of smokers was 58 years and of nonsmokers was 47 years. There were no significant differences in referral rates between the pre- and post- intervention groups across age, race, and ethnicity (see Tables 9–13).

Referral Rates

The tables below provide the referral rates of the medical providers for the pre- and post-intervention groups. Table 2 provides the number of referrals made by providers before and after the intervention, where “Yes" corresponds to referrals and "No" corresponds to non-referrals, combining all providers into a single group. Table 3 provides the referral counts to Telequit for

providers G and non-G and the total number of participants for each category, distinguishing pre-intervention from post-intervention. The pre-intervention rates between provider G and all other providers were not statistically significant (p=0.222; see Table 4). The post-intervention rates between provider G and all other providers were statistically significant (p=0.035; see Table 5).

Table 4
Pre-Intervention Rates by Provider G and Non-G

Provider	PRE-INTERVENTION		
	Yes	No	Proportion
non-G	2	7	0.222
G	19	41	0.317
p-value			0.712

Table 5
Post-Intervention Rates by Provider G and Non-G

Provider	POST-INTERVENTION		
	Yes	No	Proportion
non-G	3	4	0.429
G	3	37	0.075
p-value			**0.035**

The pre- and post-intervention referral rates to Telequit differed significantly (p = 0.045; Table 6). Only 38% of the patients referred to Telequit by all providers, enrolled during pre-intervention, and 33% enrolled during post-intervention. The pre- and post-intervention rates of the providers other than provider G did not differ significantly (p= 0.596; Table 7). The pre- and post-intervention rates for provider G differed significantly (p=0.006; Table 8).

Table 6
Pre- and Post-Intervention Rates

	Yes	No	Proportion
Pre	21	48	0.304
Post	6	41	0.128
p-value			**0.045**

Table 7

Rates by Non-G

	Yes	No	Proportion
Pre	2	7	0.222
Post	3	4	0.429
p-value			0.596

Table 8
Rates by Provider G

	Yes	No	Proportion
Pre	19	41	0.317
Post	3	37	0.075
p-value			**0.006**

Discussion

This study evaluated the effectiveness of integrating a referral to the Telequit program into the electronic health record (EHR) on the rate of program usage within a homeless rehabilitation program in a federal healthcare facility. The results were surprising, indicating that the incorporation of the Telequit referral into the EHR admission template did not affect the adherence to the program when two independent groups were compared. Incorporating the Telequit referral into the admission process did not increase the number of veteran enrollments into the Telequit program, supporting the null hypothesis. The results were evaluated using the

Reach, Effectiveness, Adoption, Implementation, and Maintenance (RE-AIM) framework, as follows.

Reach

Monitoring Reach is critical for determining if the intended audience (veteran smokers) engaged in the intervention program. This dimension can guide recruitment and retention efforts for future projects. Before the intervention, 70.6% (n=48) of the 68 admissions were current smokers, of which 43.8% (n=21) were referred to the Telequit program and 38% (n=8) engaged or enrolled in Telequit. Most of the veterans who did not enroll were not contacted by the Telequit staff. One had already quit smoking and another reported no interest in pursuing the program.

Post-intervention, 74% (n=34) of the total 46 admissions were current smokers. A total of 18% (n=6) of those 46 smokers were referred to the Telequit program, and 33% (n=2) engaged or responded to the initial Telequit contact. Most of the veterans who did not engage in the post-intervention stage were not contacted by the Telequit staff, and one stated that medications were no longer needed.

On the one hand, these results align with a previous study reporting that most individuals referred to telephone counseling did not follow through on the referral (Sherman et al., 2008). These results, however, are encouraging in that a previous study by Sherman only had 28% being referred to a smoking cessation program with only a 9% engagement (Sherman et al., 2005).

Effectiveness

Effectiveness concerns the assessment of changes in the outcomes of the intervention program, e.g., evaluating the outcomes obtained when the Telequit program was integrated into

the admission process. It provides evidence of whether the program produced positive changes or had unintended outcomes resulting from the intervention. Overall, the referral rate after the intervention was unexpectedly lower than before. A total of 30.4% of the admissions were referred to Telequit before including the Telequit consult into the admission template. This number significantly reduced to 12.8% ($p=0.045$) after the intervention. The lower referral rate is mainly accounted for by the lower referral rate recorded after the intervention conducted by medical provider G, the main provider on the unit. Before the intervention, the Telequit referrals did not differ among the providers ($p=0.712$). However, the referral rates differed significantly among the providers after the intervention (post-intervention stage; $p=0.035$). Referrals made by Provider G may have reduced due to an increased demand concerning time and a shift of focus to infection control.

Adoption

Adoption activities are concerned with organizational capability and support. The quantity, percentage, and representativeness of employees and settings adopting the intervention program are among the measures used to determine if the program can be scaled up. A total of 60% of the providers referred at least one veteran to the Telequit program during pre-intervention while 50% of the providers conducted the referral during post-intervention. Although it may seem like a reduction in provider referrals, this result may be offset by veterans declining the referral. In addition, restrictions on activities during Covid may have influenced the veterans' choice to quit smoking. Smoking was one of the few activities available to veterans that allowed them to leave the building and interact with other veterans.

The severity of the smoking problem, where veterans with very mild or very severe smoking problems may be reluctant to accept help, should also be considered. These variables may differ before and after the intervention, and across providers.

Implementation

Implementation refers to the consistency with which the program is delivered as planned by this project. Implementation metrics also keep track of program expenditures. The intervention in this project was implemented at no cost. Monitoring Implementation is critical for identifying areas where program delivery may be enhanced at the setting level. Implementation assessed the proportion of patients tested for tobacco use and the proportion of veteran smokers referred to treatment. As previously discussed, the number of smokers referred to Telequit reduced after the intervention. This area addresses how the provider engaged in the admission process to recruit the veterans. Further studies on how to successfully incorporate provider training and provider buy-in to increase Telequit referrals are needed.

Limitations

The period of March 1, 2020 to February 28, 2021 was avoided once admission was interrupted due to the COVID-19 pandemic. The pandemic may have also affected the results of this study, once policy changes were implemented to protect the residents and the number of admissions was limited. In addition, recreational activities were also reduced. The veterans were previously able to socialize in outdoor activities such as sponsored golf tournaments, deep-sea fishing expeditions, nighttime kayaking, hiking, college football games, sponsored National Basketball Association, and Major League Baseball games, among many other activities. Family visits were also suspended as a precaution against COVID 19 dissemination. These activities may have been instrumental in the recovery of the veterans and a significant source of stress

relief. The cessation of such activities may have affected the patients' decision to cease smoking. Smoking was one of the few activities available for the veterans to conduct outside the building and socialize with other veterans. People became more distressed and mental health difficulties grew significantly during the pandemic due to the extensive prohibition of activities. People, such as veterans, may not have regarded Telequit as a priority once the COVID-19 pandemic would be more of a "health hazard" than smoking.

We were also limited to a sample of homeless veterans. Further studies would evaluate the importance of Telequit within other populations. Ideally, we would also need more women and a more ethnically diverse sample.

Future Directions

The Maintenance component of the RE-AIM would play a significant role in the future direction of the study, as it refers to the process by which the program can be integrated into standard organizational practices. Factors such as continued staff assistance, collaboration with doctors, and health education, contribute to the upkeep of the unit and contribute to the development of strategies to ensure that a program receives continuous institutional and/or community support (Ory et al., 2015). The organizational leadership of the VHA remains committed to a sustainable smoking cessation program. The significant changes in the referral rate indicate the need for further provider training, so that more efficient smoking cessation messages be delivered. Training programs assist health care providers in identifying smokers and increasing the proportion of individuals who successfully stop smoking. In addition, the initiative of providing training opportunities boosts the number of individuals who receive guidance and help from health experts to stop smoking (Carson et al., 2012).

There is also a need to follow up and examine why the referral rates were reduced after the intervention. It was observed that the main provider's referral rates decreased after the intervention. Therefore, there is a need to determine the root cause for such decline. Was the decline mainly provider-related, was it due to reduced admissions to consultation, or was it due to a combination of factors?

Future studies can address the limitations presented in this study by replicating it with a larger, more diverse sample of veterans and by comparing the success of the intervention before and after the pandemic.

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Table 1

Variables and Operational Definitions by RE-AIM dimension

RE-AIM Dimension	Measures
Reach	- Number of Smokers Referred - number of smokers who were referred to the Telequit smoking cessation program during admission during pre-intervention and post-intervention timeline/All inpatient smokers within those periods - Number of Smokers Engaged - number of smokers who engaged in Telequit smoking cessation program during pre-intervention and post-intervention/All inpatient smokers within same periods
Effectiveness	- Rate of utilization of Telequit smoking cessation program in the admission process - number of providers who referred current smokers to Telequit program during admission pre-intervention and post-intervention/Total number of providers - number of referrals to Telequit Program post-intervention/number of referrals to Telequit Program pre-intervention
Adoption	- percent of providers that initiated referral to the Telequit smoking cessation program

	- number of providers that initiated referral to Telequit smoking cessation program during pre-intervention and post-intervention periods/Total number of providers
Implementation	- percent of patients screened for tobacco use within pre and post-intervention periods - number of patients screened for tobacco use/number of patients admitted - percent of smokers referred to treatment within pre and post-intervention periods - number of smokers provided with consult to Telequit/Total number of smokers screened for tobacco use
Maintenance	- Define the sustainability plan and organizational commitment post-intervention - Examine reach and effectiveness over time, post-intervention

Table 2

Referral Counts by Provider

Provider	PRE-INTERVENTION			POST-INTERVENTION		
	Yes	No	Proportion	Yes	No	Proportion
A	0	1	0.000	0	0	-----
B	0	2	0.000	0	0	-----
C	0	0	-----	0	1	0.000
D	1	1	0.500	3	2	0.600
E	1	3	0.250	0	0	-----
F	0	0	-----	0	1	0.000
G	19	41	0.317	3	37	0.075
Totals	21	48	0.304	6	41	0.128

Table 3

Referral Counts by Provider G and Others

Provider	PRE-INTERVENTION			POST-INTERVENTION		
	Yes	No	Proportion	Yes	No	Proportion
Non-G	2	7	0.222	3	4	0.429
G	19	41	0.317	3	37	0.075
Totals	21	48	0.304	6	41	0.128

Table 9

Mean Age, Pre-Intervention

Age	No	Yes
Mean	52.3	53.9
St. Dev.	11.5	11.1
t		-0.52
df		67
p		0.601

Table 10

Differentiation by Gender, Pre-Intervention

Gender	No	Yes	Totals
Male	46	20	66
Female	2	1	3
Totals	48	21	69
Chi-square			0.01
df			1
p			0.911

Table 11

Differentiation by Ethnicity, Pre-Intervention

Ethnicity	No	Yes	Totals
Asian	1	1	2
African-American	12	3	15
Caucasian	27	11	38
Hispanic	8	6	14
Totals	48	21	69
Chi-square			2.19
df			3
p			0.533

Table 12

Mean Age, Post-Intervention

Age	No	Yes
Mean	47.1	57.8
St. Dev.	13.1	13.00
t		-1.88
df		44
p		0.066

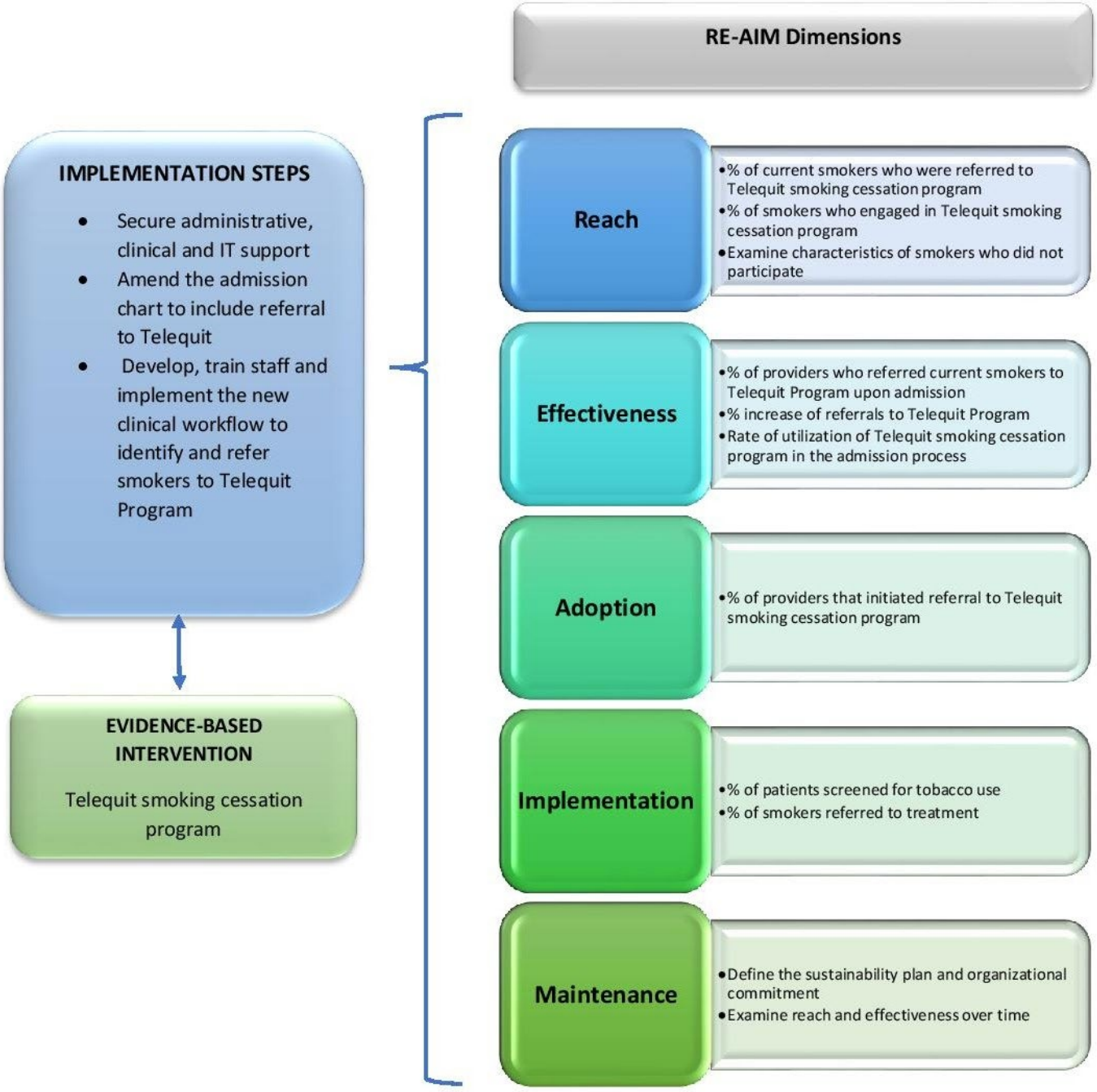
Table 13.

Differentiation by Ethnicity, Post-Intervention

Ethnicity	No	Yes	Totals
Asian	2	0	2
African-American	11	0	11
Caucasian	9	1	10
Hispanic	16	4	20
Totals	38	5	43
Chi-square			3.10
df			3
p			0.376

Appendix A

RE-AIM Framework



(Glasgow et al., 2019)

Appendix B

Unit-Wide Email Distribution

Dear Staff,

I'm reaching out to you to introduce a quality improvement initiative regarding smoking cessation among veterans. As you may already know, there are substantial health and economic consequences for U.S. military veterans because of cigarette smoking. Several diseases are linked to smoking, including various forms of cancer and respiratory and vascular diseases. According to the Centers for Disease Control and Prevention (CDC), smoking-related diseases cost about $300 billion each year, and smoking is the leading cause of preventable death, according to the Centers for Disease Control and Prevention (CDC). Also, the Veterans Health Administration spends over $1 billion per year on health services related to smoking.

The smoking cessation initiative involves modifying the medical admission template to include a Telequit referral. You are an essential process in this by encouraging hesitant veterans to enroll and screening phone calls for veterans who may not have phone access during their stay here in the program. More details about Telequit are forthcoming during one of our regularly scheduled meetings.

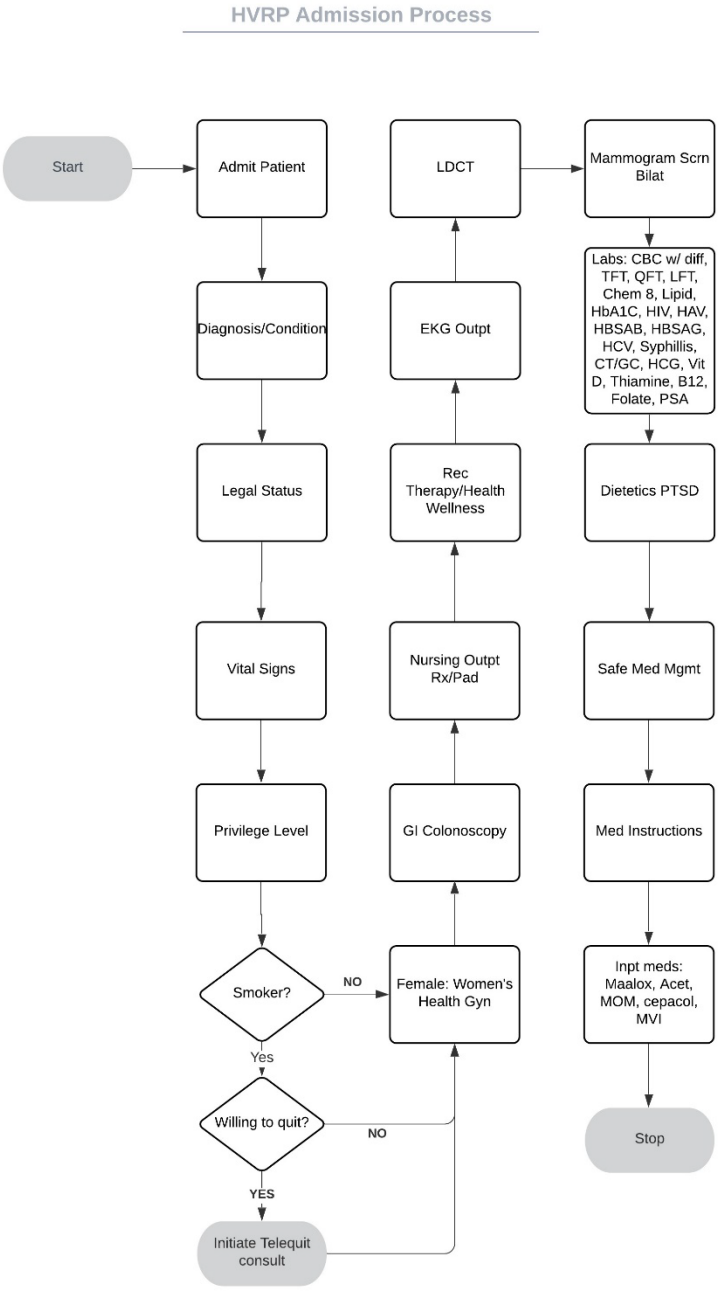
Thank you for helping our veterans recover to a smoke-free lifestyle.

Sincerely,

Fred Villarosa

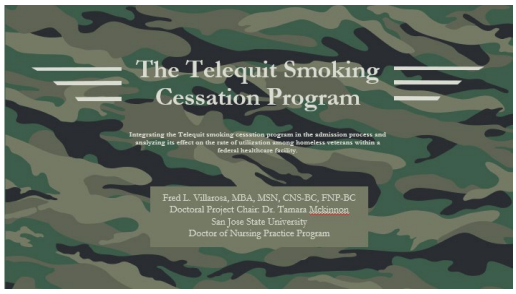
Appendix C

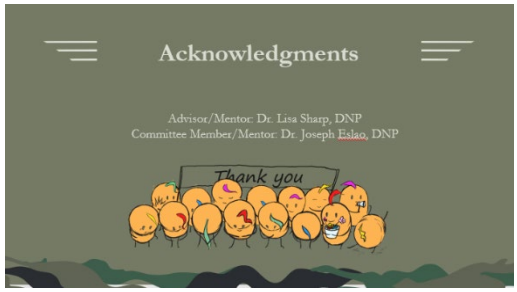
Provider Protocol

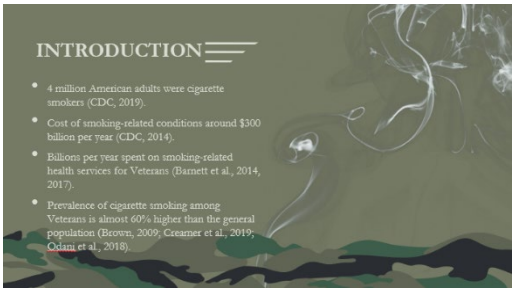


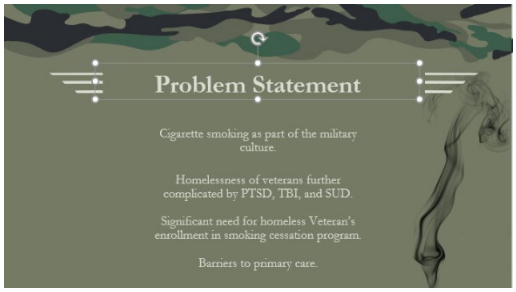
Appendix D

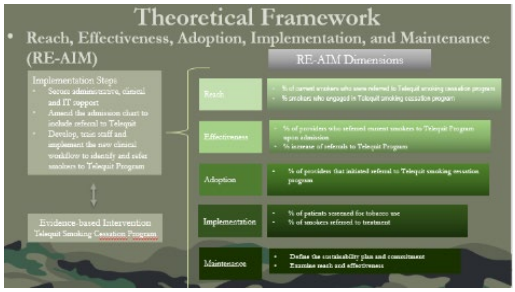
Staff Presentation

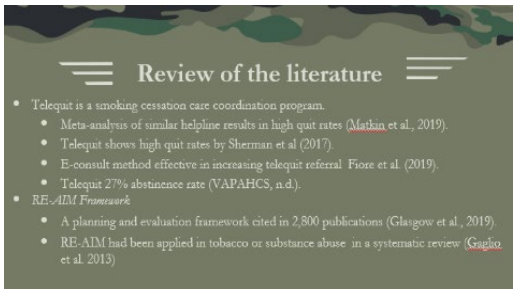


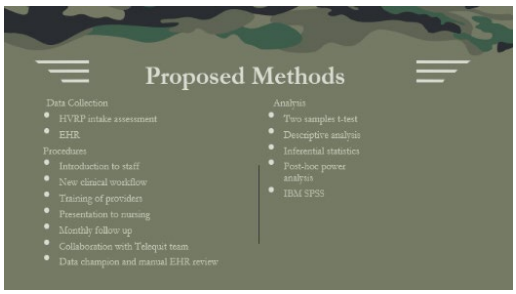


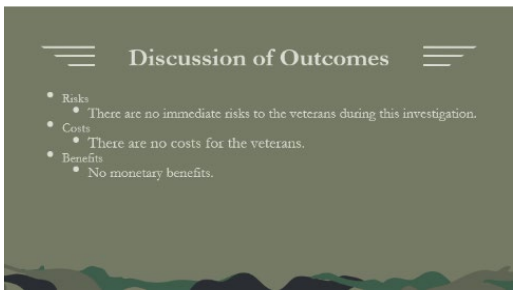






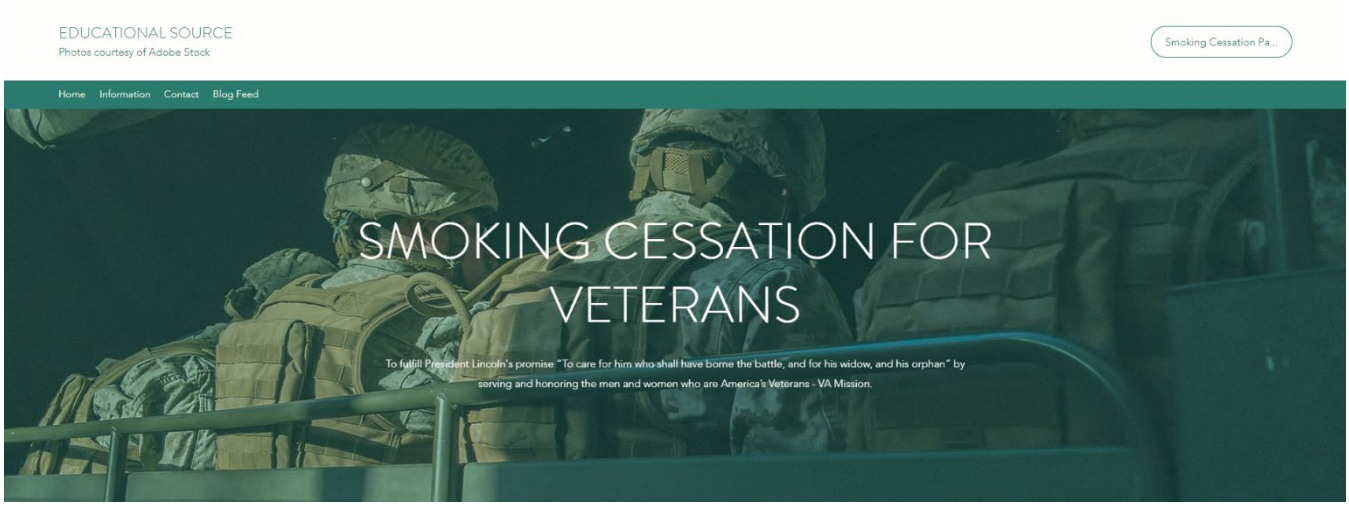






Appendix E

Educational Website



https://flvlds.wixsite.com/smokingcessation