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The Use of Telemedicine Mental Health Services Increases Access and Medication Compliance for Native American Veterans in Rural Locations

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The Use of Telemedicine Mental Health Services Increases Access and Medication Compliance for Native American Veterans in Rural Locations

Abstract

**Background:** Native American veterans compose a disproportionate amount of those who have served in the armed forces. Native veterans are more likely to be rural, have served in combat and have limited access to mental health services compared to other, non-Native rural veterans. Telemedicine may provide a unique modality which would increase access to health care and medication compliance. Although the use of telemedicine has been in place for over a decade with this population, its use is still limited and there is a dearth of studies on any long-term outcomes. Can the use of telemedicine mental health services increase access and medication compliance for Native American veterans in rural locations?

**Methods:** An exhaustive search of available medical literature was performed using Medline (Ovid and PubMed), CINAHL, Web of Science and PsycInfo using the following search terms: Native American, veteran and telemedicine. Relevant articles were assessed for quality using GRADE.

**Results:** Two studies reviewed met the inclusion criteria. A randomized trial in which 53 male Native American Vietnam veteran participants were administered the SCID (Structured Clinical Interview DSM) both in-person and via videoconferencing. Each participant completed the SCID using both modalities within a two week period. The assessment administered via videoconferencing provided accurate diagnostic information when compared to the in-person assessment. A retrospective, observational medical record and chart review was performed using the records of 85 male, Native American veterans. Information was gathered from before and after the patients’ first telehealth conference. The use of all health services by participants and psychotropic medication compliance increased after initial use of telemedicine services.

**Conclusion:** Access to mental health services increased with the introduction of telehealth services. Telemedicine is a valid treatment modality for mental health services and may be used to accurately diagnose patients who seek care. Additionally, telehealth services increased the use of prescribed, appropriate medication treatments for Native American veterans. Recommendations include the immediate expansion of telemedicine services, mental health and otherwise, for Native American veterans. More research needs to be done with multiple tribes with an emphasis on female veterans along with implications of telemedicine when mental health emergencies occur.

**Keywords:** Native American, veterans, telemedicine

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**Conclusion:** Access to mental health services increased with the introduction of telehealth services. Telemedicine is a valid treatment modality for mental health services and may be used
to accurately diagnose patients who seek care. Additionally, telehealth services increased the use of prescribed, appropriate medication treatments for Native American veterans.

Recommendations include the immediate expansion of telemedicine services, mental health and otherwise, for Native American veterans. More research needs to be done with multiple tribes with an emphasis on female veterans along with implications of telemedicine when mental health emergencies occur.

**Keywords:** *Native American, veterans, telemedicine*
Acknowledgements

To *my wife*: Thank you for helping me to succeed and for supporting me when I began to question why I was putting myself through this much work. The end is worth it.
# Table of Contents

- Abstract 2
- List of Tables 6
- List of Abbreviations 6
- Background 7
- Methods 10
- Results 10
- Discussion 14
- Conclusion 17
- Reference 19
- Tables 22
List of Tables

Table 1: GRADE Characteristics of Reviewed Studies

List of Abbreviations

IHS……………………………………………………………………...…Indian Health Service
VA………………………………………………………………………..Veterans Administration
TOW……………………………………………………………… ……… Tribal Outreach Worker
SCID…………………………………………………………..Structured Clinical Interview DSM
GRADE……………..Grading of Recommendations, Assessment, Development and Evaluations
AIVVP………………………………………………..American Indian Vietnam Veterans Project
PTSD……………………………………………………………… Posttraumatic Stress Disorder
The Use of Telemedicine Mental Health Services Increases Access and Medication Compliance for Native American Veterans in Rural Locations

BACKGROUND

Native American veterans have a long tradition of service in the armed forces. The service rate of Native American veterans in the United States armed forces exceeds that of any other ethnic group per capita. Despite this fact, rural Native veterans, especially those in rural communities, face many obstacles in accessing veteran care.¹

The Native American population in general is more likely to be in worse health than other ethnic/racial groups as a whole. This includes such factors as increased difficulty hearing, diabetes, and inability to access health care because of cost. Use of alcohol and tobacco is more likely as is the increased incidence of recent psychological distress.² In fact, “rural Native veterans often are among the most impoverished with little access to training opportunities and few viable prospects for employment—all factors which are closely tied to poor health outcomes.”¹

Kaufman et al³ found that more Native veterans lived in rural locations (41% vs. 35%) and highly rural locations (8% vs 2%) than veterans not claiming Native descent. As pointed out in the study, the rate of Native veterans in highly rural locations exceeds three times the number of non-Native veterans in that same classification.³ For rural Native American veterans living on or near reservation land, access to health care and transportation issues may all stem from the dispersed and sometimes isolated nature of their existence.¹,³ Cultural differences may often
overlap with geographical difficulties to providing care. Each tribe is its own nation and there are an estimated 566 tribes in existence with populations speaking a variety of languages.¹,⁴

Demographically, rural Native veterans are more likely to be both younger and female than their non-Native counterparts. Additionally, Native veterans have higher rates of service in combat than their non-Native counterparts. This coincides with an increased number of Native veterans with service connected disabilities comparatively. Kaufman et al found that 53% of Native veterans reported not having health insurance.³ With those that are insured, navigating the web of types of insurance (IHS/VA/Private/Tribal) and the level of care provided, including medications covered, can be daunting.¹ For those Native veterans seeking mental health care, or those who are looking for some continuity of care, there are additional difficulties accessing care.

Efforts and strategies surrounding the recruitment and retention of healthcare providers to live and work in rural areas including reservation lands exist. Difficulties in recruitment stem from the isolation of many of the communities, housing, relatively low pay for providers, and lack of community infrastructure and recreational opportunities for providers who decide to move to these areas.⁴,⁵ Providers are generally not trained to provide care in a culturally competent manner which places distance between the patient and provider. A shortage of providers generally and mental health providers specifically lowers the possibility, along with other access issues, of patient’s receiving appropriate care.⁴,⁶

Although the scope of this paper is intentionally broad, the limited number of studies that have been done with Native veterans with mental health issues have generally focused on substance abuse and posttraumatic stress disorder (PTSD). These mental health issues are understandably important to each tribe because of the community issues that stem from a
returning veteran’s mental illness. Work, family and education are all possibly affected by untreated mental health issues.\textsuperscript{1}

From previous studies,\textsuperscript{1-3} we now understand that Native veterans are more likely to suffer from PTSD and are generally more likely to have been involved in combat during conflict. Vietnam veterans are more likely than their non-Native counterparts to have been involved in heavier combat.\textsuperscript{1,7} A previous study\textsuperscript{8} has affirmed that rural veterans in general are less likely to access care for PTSD than their urban counterparts. The assumption being that travel, cost, time off work, childcare, and geographic location make accessing care in a non “emergent care” situation prohibitive for those in a rural setting.\textsuperscript{1,8} The possibility that Native veterans are suffering because of a lack of care, including lack of treatment with appropriate medications that could ease suffering, along with additional undiagnosed mental health problems because of this lack of care is a concerning issue.

Telemedicine mental health services may be a treatment and diagnostic modality which can be used to help bridge the gap between a population of veterans in need of mental health services and a lack of resources in their communities. Telehealth services have been made available to Native veterans in specific locations since 2003.\textsuperscript{1,9} The pilot program began on the Rosebud Sioux Tribes Reservation in South Dakota. Before beginning care through telepsychiatry, Native veterans identified issues surrounding difficulty in accessing care or reasons that they did not access care such as transportation difficulties and stigma in a small community. Although patients had some initial concerns the conclusion reached by the authors was that telepsychiatry is a valid treatment modality for Native veterans seeking mental health treatment.\textsuperscript{9} A review\textsuperscript{10} of the present status of rural Native veteran telehealth in 2012 highlighted some success of clinics that are now implementing this model of mental health care. Although
over a decade has passed since telemedicine was first utilized with Native veterans, there is still a
dearth of quality studies exploring telemedicine and its role with Native American veteran
mental health care. Clinics are limited to Northern Plains Indian Tribes in Wyoming, Montana
and South Dakota. Additionally, there have been no studies or data analysis which provide
information on how telemedicine increases medication prescription or compliance.

METHODS

An exhaustive search of available medical literature was performed using Medline (Ovid
and PubMed), CINAHL, Web of Science and PsycInfo using the following search terms: Native
American, veteran and telemedicine. The search further excluded all articles not in English. The
reference section of each article was used for additional articles of relevance. Articles which
included data on rural Native American veterans’ use of mental health services were included.
Relevant articles were assessed for quality using GRADE.11

RESULTS

The search initially resulted in 28 articles. After inclusion criteria were applied for
screening, two studies were included. These studies consisted of one randomized trial12 and one
observational, retrospective study13 with the same lead author. See Table 1.

Shore et al (2007)

This randomized trial12 evaluated the capability of diagnosing mental illness using
videoconferencing administration of the Structured Clinical Interview for DSM (SCID). The
participants in the trial were all male Native American veterans from the same Northern Plains
Tribe and reservation. All who enrolled in the trial had previously completed the SCID
assessment some eight years prior for a larger study known as the American Indian Vietnam
Veterans Project. The authors concluded that this population had a large prevalence of psychiatric disorders and therefore represented an appropriate test group. All participants were Vietnam veterans between the ages of 46 and 71.\textsuperscript{12}

Each participant was administered the SCID by both an in-person interviewer and videoconferencing. A maximum of two weeks was allowed between the administration of each SCID. Patients were divided into four cohorts of 10-15 which were randomly assigned through an experimental design and did one of the two assessments first. Sixty patients were enrolled in the study with fifty-three completing both assessments. The study was conducted in 2003 and completed within one year. The primary outcome investigated was whether reliable diagnoses could be made via videoconferencing as opposed to in-person counseling. Secondary outcomes that were studied using the data from this trial were the economic feasibility of telemedicine and its acceptability as a treatment modality to the Native American population.\textsuperscript{12}

A paired T-test was performed to assess for the influence of interview timing in diagnostic outcome. The authors reported no reportable difference in outcomes. The Kappa statistic was used to evaluate agreement between modalities in addition to percent agreement. Because of the disparities in the prevalence of externalizing and internalizing disorders, further classification was used. Kappa scores were rated as excellent (>0.92), good/very good (>0.6), and fair (>0.4). Statistics were reported for evaluation of current month, past year and lifetime diagnoses.\textsuperscript{12}

This study concluded that, in most cases, diagnostic evaluation for mental health disorders through videoconferencing was accurate and similar to those made by an in-person provider. The study’s authors found an 80\% agreement overall between diagnostic modalities with few exceptions. The study concludes that 76\% of the kappa scores exceeded 0.6.
Videoconferencing as a modality was found to be in the most agreement in diagnosing externalizing disorders which include major depression, dysthymia, and generalized anxiety disorder (kappa 0.73). The authors found less agreement for the diagnosis of internalizing disorders overall (kappa 0.53) although the diagnosis for 1 month and 1 year PTSD (0.63) and lifetime PTSD (0.75) was rated fair or above. Percent agreement between modalities was above 80% for drug abuse, alcohol abuse and all substance abuse at 1 month and 1 year. Percent agreement for lifetime drug abuse (76%), lifetime substance abuse (72%), and lifetime major depressive disorder (66%) were lower.\textsuperscript{12}

The authors noted several limitations to their study. The variation in prevalence of certain disorders made conclusions on certain disorders unreliable. The two week interval between interviews could be problematic and affect the patients reporting of various symptoms resulting in inaccurate diagnoses. Lastly, the authors felt that the homogeneity of their study makes it impossible to generalize their data for other populations.\textsuperscript{12}

\textbf{Shore et al (2012)}

This was an observational retrospective study\textsuperscript{13} which reviewed medical records and charts to assess use of telemental health services by a population of rural, Native American veterans. The study reviewed the charts and medical records of 85 rural, Native American males between the ages of 33 to 87 who received care at two rural telemental health clinics for Native veterans with a focus on posttraumatic stress disorder (PTSD). Denver based mental health clinicians provided care via teleconferencing. Data was gathered on patients use of any health service (mental health or otherwise), the number of patients receiving psychotropic medications, and other demographic and hospital admission data before and after their first telemental health intake appointment. Both active and inactive patients were used in the study. For active patients,
data was gathered from one year before their first appointment through May 31, 2006. For inactive patients, data was gathered beginning from one year before their first appointment through six months after their last telehealth appointment.\textsuperscript{13}

The primary endpoint studied was the use of services after the initial telehealth visit. Secondary endpoints included number of patients receiving psychotropic medications, inpatient hospital admissions in general, and psychiatric inpatient admissions. Data gathered included information on service related disability (71\%) and Global Assessment Functioning (GAF) scores (ranging from 0 to 100 with 100 being an optimal score). The mean score was 45.7. After intake data gathered included most common problems addressed at each visit (PTSD) along with additional comorbidities.\textsuperscript{13}

The authors report that after their initial telehealth intake session, use of all health services (mental health and otherwise) increased from 74\% before intake to 94\% (p<.01) after intake (RR=1.24). There were 26\% of participants before the study who received psychotropic medications which increased to 71\% (p<.01) after intake at the telemedicine clinic (RR=2.73). After intake most visits comprised a follow-up with medication management (46\%). The authors noted that there was a “nonsignificant trend toward lower rates of hospitalization among these patients and fewer hospitalizations per patient.”\textsuperscript{13}

The authors concluded that utilization and access to all health services increased after initial intake at telemedicine clinic. The authors noted a significant rise in the rate of veterans being prescribed psychotropic medications. The authors believed that while telehealth services increase access to the specific service being provided, in this case mental health services, they also possibly increase connection to the hospital care structure allowing for greater communication and understanding. The authors noted that this study was inherently limited by
its observational nature, lack of a control group, its homogeneity and no prospective information.\textsuperscript{13}

**DISCUSSION**

According to the preliminary findings in these pioneer studies,\textsuperscript{12,13} telemental health services can increase access to care for rural, Native veterans. Access to these services can also lead to an increase in initial prescription of and compliance with suggested and appropriate medication regimens and increase use of health services overall. Although previous studies have shown positive outcomes when access to telemedicine mental health services were provided, active telemental health services are only being provided in three states and developing in one other.\textsuperscript{1,10} No telemedicine programs providing mental health care to veterans has been discovered in other regions of the country. The results of the two studies reviewed here suggest that telemedicine can be implemented as a standard of care on reservations where there is no access to a mental health provider or where access is limited.

Patients receiving prescriptions for psychotropic medications increased by over 45% indicating that telemedicine increases access and initial medication prescriptions. This increase in prescribed medications may account for an overall lowering of hospital admissions due to decreased emergent symptom development. Patients use of health services overall was shown to increase after participation in the initial telemedicine intake session.\textsuperscript{13} The possibility that communication difficulties preclude the use of all medical services is an important consideration. A previous review\textsuperscript{1,10} has shown both patient and provider satisfaction with those programs already in place, especially when TOWs (Tribal Outreach Workers), who are generally tribal members and veterans, can assist with any adjustment and troubleshoot any issue. Davis et al\textsuperscript{14} found that this more collaborative approach to care works better with all minority patients.
specifically in regards to patients who require possible psychotherapy and medication interventions. Patients in this study had a team of a RN, pharmacist, and psychotherapist who were available for consultation via videoconference or phone. Minority patients responded well to this collaborative care. Morland et al\textsuperscript{15} found that the receipt of psychotherapy through videoconferencing with rural veterans was equivalent to in-person treatment and that patients were generally satisfied with their care. Data from the studies included in this review support this finding.

Further analysis of data from the Shore et al (2007) study\textsuperscript{12} along with a study run concurrently provided data on the possible economic impact of telemedicine program implementation and the acceptability of receiving telehealth services to the Native American veteran population respectively.\textsuperscript{16,17} All 53 patients in the Shore et al (20007) study\textsuperscript{12} completed both an ethnic identity survey and participated in a face-to-face debriefing interview by a research assistant after the initial study’s completion. Interviewers were also asked to rate how their patients were responding and whether they seemed trusting and accepting of the process. Patient satisfaction was no different in the telemedicine interview compared to the in-person interview. And, 94\% of the participants rated their videoconferencing experience as good.\textsuperscript{17}

Economic analysis was performed by creating two models of data. One with actual costs accrued during implementation of the telemedicine clinic and the other with data from costs which would have accrued if the structure was not in place to perform any telemental health interventions at all. Researchers also looked at comparative costs between 2003 and 2005 to partially account for decreasing technology expenses over time. The study concluded that telemedicine mental health services can be provided at a generally lower cost than in-person services. The study also found indirect benefits like reducing the cost and time of travel. Researchers found that telehealth was
more expensive than in-person care if the provider was a salaried worker earning $39,000 or less and associated with an established clinic.\textsuperscript{16}

While the studies show effective, accurate treatment and increased access to care through telemedicine, they have several limitations. Both studies used only male veterans.\textsuperscript{12,13} Female veterans now compose the majority of Native, rural veterans and it’s important to create programs that specifically address their needs.\textsuperscript{3} Shore et al (2007) study\textsuperscript{12} participants were limited to one tribe or reservation making it impossible to generalize information across other Tribal populations. Although the Shore et al (2007) study\textsuperscript{12} was randomized, neither had a control group. Both studies had restrictive age ranges with the Shore et al (2007) study\textsuperscript{12} only accepting Vietnam era veterans who had participated in a single previous study and the Shore et al (2012) study\textsuperscript{13} lower age range cutoff was 33. This leaves out important information on younger veterans returning from more recent conflicts with a particular subset of issues. The Shore et al (2007) study\textsuperscript{12} had only two week intervals between testing and participants were already familiar with the SCID. Each trial had a small number of participants making it difficult to come up with reliable connections because of over-representation of high-prevalence issues and low representation of low-prevalence issues.\textsuperscript{12,13} The Shore et al (2012) study\textsuperscript{13} was an observational, retrospective study which began at low quality. Both studies had unclear selection criteria with no indication in the diagnostic study to blinding, allocation or reasons of losses to follow-up. It must also be noted that the lead author for both studies was the same, presenting an additional source of bias. Both studies received a very low GRADE score (Table 1) due to the quality of evidence presented.\textsuperscript{12,13}

Recommendations for further study would begin with the inclusion of female veterans in all studies while expanding age ranges to include those younger veterans returning from more
recent conflicts. Although the diversity and geographical dispersion of Tribes and their veteran populations may increase difficulty of study, previous studies have been extremely homogenous, including a limited number of Tribes from the southwest and northern plains.\textsuperscript{1,4,10,12,13} Although work has been done to review civil commitments and telepsychiatry, more work should be done in regards to aspects of telemedicine dealing with mental health emergencies and other legal issues.\textsuperscript{18} Additionally, more RCTs should be developed addressing the issues of long term medication compliance along with other pharmacological issues. Aside from additional studies and trials, case studies highlighting best practices and feedback from Tribal members in a culturally sensitive matter is warranted. Understanding how to integrate Tribal practice unique to each Tribe into telemedical care with successful examples highlighted would be important both to the providers and to rural Tribal members.\textsuperscript{19} Integrating Tribal beliefs and addressing concerns is equally as important to implementing a functional system as is diagnostic accuracy. Finally, more research from the side of clinicians should be done to overlap with previous studies addressing how mental health providers feel healthcare challenges should be addressed and how telemedicine fits into this role of mental health provision.\textsuperscript{20,21}

CONCLUSION

This review further increases our understanding that telehealth leads to improvements in initial prescription of and compliance with appropriate psychotropic medications. There is also a possible and intuitive connection between access to telemedicine services for mental health care and increased access and understanding of all health services. There is also the possibility of a decrease in general hospital admissions and an actual cost savings with the implementation of telehealth services.
Telemedicine is one treatment modality and not an answer to all Native veterans’ health concerns. Most Native veterans would agree that “outside help and telemental health is the not answer to the communities need for resources or change; instead telemental health offers an option to help support certain goals.”\textsuperscript{19}

At a minimum, further research should be done to improve clinics already in place and increase their efficiency. Additionally, study emphasis should be placed on female Native veterans among whom almost no study information exists. It is also important to address protocols for medical emergencies that occur and other medical-legal issues that may arise, unique to this new treatment modality.

This systematic review of literature adds to the growing body of evidence supporting the immediate implementation of telemedicine mental health services on and near reservations to increase access to mental health services for rural Native American veterans. The ability to provide mental health care for rural Native veterans is important and possible with the advent of telehealth services. Because of pioneering studies in telehealth services showing its efficacy and cost effectiveness, with no negative impact on the patients, a strong recommendation for further and more widespread implementation of telehealth services can be made.
References


15. Morland, Leslie A.; Mackintosh, Margaret-Anne; Greene, Carolyn J.; et al.Cognitive processing therapy for posttraumatic stress disorder delivered to rural Veterans via


Table 1. GRADE Characteristics of Reviewed Studies

<table>
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<tr>
<td>Randomized Trial</td>
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<td>Observational</td>
<td>Serious limitations(^a)</td>
<td>No serious indirectness</td>
<td>Serious imprecision</td>
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\(^{a}\) Narrow sampling of Native population;
\(^{b}\) Lack of blinding especially of the providers assessing the participants;
\(^{c}\) Small sample size (and low prevalence of outcomes)
\(^{d}\) Same lead author and institution for both studies