

Telemedicine for the American Indian/Alaska Native Population

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Abstract

When compared to other Americans' health, a worse health status is seen among the American Indian and Alaska Native population. American Indians and Alaska Natives are faced with numerous disparities in healthcare, such as decreased access to healthcare. Additionally, healthcare data about this group are missing. Although health beliefs and traditions can differ among tribes, there are also similarities. Telemedicine is the use of technology (i.e., phone, videoconferencing) to deliver healthcare. This healthcare service may be beneficial for this population's healthcare needs because of telemedicine's possible advantages. Although telemedicine also has disadvantages, a knowledge of and respect for American Indian and Alaska Native cultures can help to overcome the disadvantages.

Keywords: American Indian, Alaska Native, telemedicine, telehealth

Telemedicine for the American Indian/Alaska Native Population

The American Indian/Alaska Native (AI/AN) population, compared with the rest of the American population, have a lower health status. Life expectancy, access to healthcare, and death rates due to certain diseases are some of the health differences between AI/ANs and the American population in general (Indian Health Service, 2016). Within this population, there are hundreds of tribes; there is a total of 567 tribes acknowledged by the United States government according to the Bureau of Indian Affairs (2017). Similarities exist in culture and health beliefs among tribes.

The American Telemedicine Association (2016) describes telemedicine as the use of technology systems such as computer, video, and phone to deliver healthcare. There are several benefits of telemedicine for the AI/AN population (Carroll et al., 2011; Doorenbos et al., 2010; Doorenbos et al., 2011; Haozous et al., 2012; Hiratsuka, Delafield, Starks, Ambrose, & Mau, 2013). However, there are also disadvantages to using telemedicine for this population (Demiris, Doorenbos, & Towle, 2009; Hiratsuka et al., 2013). The nomenclature of this unique population must first be understood in order to help AI/AN peoples' healthcare experience (Moss, 2016b; Van Alst, 2016).

Self-Identification and Proper Terminology

The way an American Indian or Alaska Native person identifies himself or herself is the way the nurse should refer to that person (Moss, 2016a). *Indian* and *American Indian* are the terms most American indigenous people prefer to be called. *Native* is the abbreviated version of *Native American*, and is usually considered an appropriate term by most American Indians. However, if the specific tribe of the person is known, this tribal identity is the most desired term to use when talking to or about the person (Van Alst, 2016).

The term American Indian does not refer to cultural or ethnic identification as much as it does to political status. *Indian* is the official legal word for the indigenous people of the United States because it is the word used in the European/American-Indian treaties (Moss, 2016b). The term *Native American*, though, was substituted for *American Indian* in the 1970s. However, this term is not accurate because Native Hawaiians, American Samoans, and indigenous groups from Canada and Central and South America can also be referred to as Native Americans (Bureau of Indian Affairs, 2017). Furthermore, there is a difference between the terms *American Indian* and *Alaska Native*. A person who has a tribal heritage from the continental United States is American Indian, while a person who has a heritage from Alaska native villages or tribes is Alaska Native (Bureau of Indian Affairs, 2017). The book *American Indian Health and Nursing* edited by Margaret P. Moss focuses on the indigenous people groups of the United States (specifically American Indians and Alaska Natives), and these indigenous people groups will also be the focus in this discussion (Moss, 2016b). Additionally, the abbreviation AI/AN will be used when referring to the American Indian/Alaska Native population because it is an abbreviation used in some of the literature (Doorenbos et al., 2010; Doorenbos et al., 2011; Haozous et al., 2012; Hiratsuka et al., 2013; Hodgins & Hodgins, 2013; Indian Health Service, 2016; Kim, Bryant, Goins, Worley, & Chiriboga, 2012; Martin & Moss, 2016; Meilstrup & Moss, 2016; Moss, 2016b; Moss, 2016c).

Sovereignty Status

In the United States (US), there are federally recognized AI/AN tribes. This recognition means that the US sees the tribe as having sovereignty or its own government. However, the status of US citizenship is still held by AI/ANs. The US government gives services, benefits, and protections to the tribe, such as healthcare services. With the exception of permission granted by

Congress, states do not have political control over federal tribes. For example, the laws on reservations do not have to be in agreement with state laws. However, possessing a government-government relationship with a state is an option for tribes. The number of tribes and villages acknowledged by the US government is 567 (Bureau of Indian Affairs, 2017).

Federally recognized tribes have a unique status regarding laws. For example, tribes do not have to follow state laws on reservations. Instead, they can implement their own tribal laws on the reservation. Also, if a tribe and the state in which it is located share a common goal (i.e., environmental preservation), the tribal government and state government may choose to work together through compacts (Bureau of Indian Affairs, 2017).

Legally, the United States government has certain responsibilities (i.e., healthcare services) toward members of federally recognized tribes. However, the government does not regulate the rules for tribal membership. To be part of most tribes, a person must have a certain percentage of AI/AN heritage, which is called a blood quantum. A tribe may also take into account the person's knowledge of the tribe's history and culture as well as the person's self-perception of his or her tribal heritage (Bureau of Indian Affairs, 2017).

Where AI/ANs Live

According to the 2010 United States Census Bureau (2012), the percentage of AI/ANs not living in tribal areas is 78%. Due to the employment and education opportunities found in cities, many American Indians move away from reservations (Bureau of Indian Affairs, 2017). Data, however, also reveal that many AI/ANs live near these tribal areas. California, Oklahoma, Arizona, Texas, New York, New Mexico, Washington, North Carolina, Florida, and Michigan are the states in which the highest percentages of AI/ANs take up residency (United States Census Bureau, 2012).

The Indian Health System

The Indian Health Service, Tribal Health, and Urban Health Care (I/T/U) is the official health system for AI/ANs (Meilstrup & Moss, 2016). The Indian Health Service (IHS) is a branch of the United States Department of Health and Human Services that provides medical services to AI/AN people (Bureau of Indian Affairs, 2017). The overall mission of the IHS is to “raise the physical, mental, social, and spiritual health of American Indians and Alaska Natives to the highest level” (Indian Health Service, n.d., 1). Tribes, budgets approved by Congress, and third-party organizations (i.e., Medicare, Medicaid, private health insurance companies) all fund the IHS. AI/ANs normally choose health care from the IHS because it is more convenient to use than other facilities and insurance programs due to reasons such as poverty, language difficulties, and complicated paperwork processes (Meilstrup & Moss, 2016).

The tribal health component of I/T/U allows autonomy in healthcare system management for the tribe. For example, tribal health is responsible for the hiring process in tribal medical facilities (Meilstrup & Moss, 2016). For AI/ANs who live in cities, there may be urban health centers available for referrals, education, and counseling. However, usually there is no medical care given (Martin & Moss, 2016). According to the map from the Urban Indian Health Institute (2017), there are 33 of these centers total in the United States, and they are not located in every state. Overall, the funding is low for urban AI/AN healthcare (Martin & Moss, 2016).

Gaps in the Literature

There is not much health research available about the AI/AN population due to the tribes’ political sovereignty. Political sovereignty forces researchers to fulfill more obligations than usual in order to study the AI/AN population. For example, researchers may have to get approved by a tribal institutional review board, the Tribal Council, and the head of the tribe.

Fulfilling such requirements can take up to a year and impedes the research process. Research agencies have specified time periods (for example, 12 weeks) in which a research proposal must be completed, therefore, if the process of getting approved by a tribe takes a year, it is not possible to do the research. Because of the difficulty in conducting research, there is a lack of health information about this population (Moss, 2016c).

AI/AN Cultures: Social Views

Within AI/AN collectivist societies, relationships are highly valued. While the ability to speak for oneself is a guaranteed right, the group is more important than the individual. Instead of being competitive, AI/ANs usually rely on one another. Youth are taught traditions by elders, who also make decisions in the family. In spite of this fact, children are allowed to make some decisions for themselves. It would be acceptable in these cultures for a child to refuse medication. Typical attitudes in AI/AN cultures are that time is abundant, there is no need to rush and be prompt, and value is not placed on making plans (Hodgins & Hodgins, 2013).

AI/AN Views of Health

Even though AI/AN peoples' beliefs have changed due to the influence of European cultures, there is traditional knowledge currently used by AI/AN healers and patients (Greymorning, 2016). Though there is some variation among different tribes, there are several similar health beliefs held by many AI/AN cultures. For example, the belief that the body and spirit are inseparable is a common health belief among tribes. The belief that a person can help heal himself or herself is also held by a lot of traditional healers (National Library of Medicine, n.d.).

The traditional cultural perspective of AI/ANs expands the meaning of the word medicine. To AI/ANs, medicine can help cure illness as well as promote wellness. It can also be

good or bad and is a type of spiritual power. Good medicine comes from the healer who is kind, while bad medicine comes from a person who is evil. Based on this principle, Western medical instruments, such as a stethoscope, can be considered good or bad based on the character of the person who uses them. Medicine can come from objects, people, places, and events. For example, prayers and herbs are both considered medicine (Cohen, 2003).

There are other core beliefs of some AI/AN people that relate to health and disease. One such belief is that all living beings were created by the Great Spirit. Because of this, praying to the Great Spirit and spirits created by the Great Spirit is beneficial and should be done several times a day, such as at mealtimes. Another belief is that one must be in balance with nature to be healthy. Therefore, when one becomes ill, it may be in part because there is an imbalance between the person and nature (Cohen, 2003). Some AI/AN people also believe that witchcraft and performing a taboo action can result in illness (Hodgins & Hodgins, 2013). Furthermore, it is believed among some AI/AN people that components of nature are alive, and are both physical and spiritual. A significant contrast to note between Western and AI/AN approaches regarding disease is that the Western approach believes microscopic agents cause disease and must be eradicated, while the AI/AN approach incorporates a variety of aspects (i.e. physical, environmental, and spiritual) as causative agents for and effects of disease (Cohen, 2003).

A symbol of holism for AI/ANs is the medicine wheel (Moss, 2016b). Holism is a medical approach that considers a person's mind, body, and spirit when treating illness (Cohen, 2003). The wheel is a circle separated into four parts, which can represent different ideas depending on the tribe. The physical, mental, emotional, and spiritual aspects of a person are the components of one interpretation of the medicine wheel. The four parts can also represent the four directions, four seasons, and four stages of life (Moss, 2016b; National Library of Medicine,

n.d.). The purpose of the wheel is to heal and promote well-being (National Library of Medicine, n.d.).

Health Traditions

Health traditions, like health beliefs, also depend on the particular tribe. However, there are similar practices amongst tribes. Prayer, drumming, and chanting during a healing ceremony are examples of shared practices. Another similarity among many AI/AN cultures is the use of a healer. Stories, humor, plants, music, and ceremonies are used by the healer to promote well-being (National Library of Medicine, n.d.)

Indian doctor is an alternative name for an AI/AN health practitioner. There are many different names for AI/AN health practitioners depending on the specialty. Herbalists, bone-setters, diviners, and midwives are specialty practitioners. A medicine man (or woman) is considered holy and has spiritual power. After a healer has shown the community that he or she is knowledgeable and experienced in healing, usually the members of the community call the healer a medicine person as a term of honor. The title of medicine person should be used rather than shaman, because shaman is a term for a type of health practitioner from Asian cultures (Cohen, 2003).

Furthermore, silence is a cultural practice in the AI/AN community that is necessary for the healthcare provider and patient to observe. Respect for other people is shown through the use of silence, because it shows willingness to cooperate. Asking questions and making small talk is not considered respectful. A trait that is considered positive in AI/AN cultures involves not making judgements about what the other person is saying, or having a “silent mind” (Cohen, 2003, 40). In traditional AI/AN medicine, silence promotes paying attention to other forms of communication such as body language in order to discover health problems. Some AI/ANs

believe that speaking about disease will give it power and may be detrimental to the patient (Cohen, 2003).

Historical Context

Laws regarding trading and land ownership agreements between American Indians and settlers were established by the United States government beginning in 1784 to prevent fighting between the two groups. The government then implemented the Indian Removal Act of 1830 as a solution to the fighting between settlers and American Indians. Some American Indian tribes, such as the Cherokee, were ordered by the military to move away from their homelands. American Indians were given individual land rights to assimilate them into the broad American culture under the General Allotment Act of 1887. The Indian Reorganization Act of 1934 stopped the land distribution and attempted to give some control back to tribes because American Indians had lost more than 86 million acres of land. Self-determination became an official policy in 1970 (United States Department of the Interior, 2014). Additionally, whole tribes of AI/ANs, who did not have immunity, were killed by communicable diseases that European settlers brought. Some of the diseases that AI/ANs were affected by are tuberculosis, smallpox, and influenza (Hodgins & Hodgins, 2013). Originally, it was the job of the Bureau of Indian Affairs to provide healthcare services to AI/ANs, however this became the duty of the Indian Health Service under the United States Department of Health and Human Services in 1955 (Bureau of Indian Affairs, 2017).

Health Status and Disparities

When contrasting the health status between AI/ANs and other Americans, the health status of AI/ANs is poorer. This trend has also been true in the past. Insufficient education, inequality in poverty rates, healthcare discrimination to AI/ANs, and cultural differences are all

possible explanations for disparities. The life expectancy for AI/ANs (73.7 years) is 4.4 years lower than the life expectancy for all races in the United States (78.1 years). When comparing the total AI/AN death rate from all causes during the three-year period from 2007 to 2009 (943.0) and the death rate from all causes for all races in the United States during the year 2008 (774.9), the AI/AN death rate was higher. There was no annual information available for those three years for the AI/AN population; there was no indication that 2008 was a typical year for all races in the United States. For those same years, the AI/AN rates of death due to unintentional injuries, assault/homicide, chronic liver disease/cirrhosis, and diabetes mellitus were also higher than the death rates from those causes for all races in the United States (Indian Health Service, 2016). Driving under the influence of alcohol is also a source of numerous unintentional injuries (Hodgins & Hodgins, 2013). Furthermore, compared with other racial groups, preventable health problems (i.e., diabetes, obesity) with inferior health outcomes are more prevalent in this population (United States Department of Health and Human Services, 2012).

There are more AI/ANs living off tribal areas than those living on tribal areas (Indian Affairs, 2016; United States Census Bureau, 2012). In many urban health centers specifically serving AI/ANs, medical care with the exception of education, referrals, and counseling is not offered (Martin & Moss, 2016). For AI/ANs who live on remote reservations, there is often difficulty accessing health care services. In fact, Indian Health Service facilities are not able to be accessed by over 4 in 10 AI/ANs (United States Department of Health and Human Services, 2012).

Specifically, there is also decreased access to health care for AI/ANs who are elderly and disabled. The Kaiser Family Foundation published a report on the health care accessibility of AI/ANs who are elderly (65 years and older) or who have disabilities and receive health care

coverage through Medicare. This study found that, compared with the rest of the elderly American population (65 years and older) with Medicare, more elderly AI/ANs said they were in poor health and had trouble accessing care. In particular, non-emergent care access seems to be an issue. Through purchased or referred care (PRC), AI/ANs may receive free healthcare from non-Indian Health Service (IHS) facilities if the IHS cannot meet the health care demands. However, PRC is usually only used for emergencies because of limited IHS funding. Because of this, AI/ANs with Medicare may not be able to get the medical care they need (Boccuti, Swoope, & Artiga, n.d.).

A research study shows that compared with elderly non-Hispanic whites, more elderly AI/ANs reported having low health status and decreased access to health care. The 2009 California Health Interview Survey surveyed non-Hispanic whites and AI/ANs age 60 and older. The results of the study show that a lower health status was reported by AI/ANs compared with non-Hispanic whites. For example, more AI/ANs than non-Hispanic whites claimed they have diabetes, heart disease, asthma, and disability. Also, compared to non-Hispanic whites, AI/ANs stated that they less frequently see a doctor and have more emergency room visits. Furthermore, more AI/ANs than non-Hispanic whites reported not having a primary care provider. Possible reasons for such disparities are related to finances and education, since AI/ANs have lower income, less education, and less English proficiency than the other surveyed group. Although this is one study, it shows differences between health status and accessibility between AI/ANs and white people. The study concluded that compared with non-Hispanic whites, there is a higher risk of low health status and decreased access to healthcare for AI/ANs (Kim et al., 2012).

Overview of Telemedicine and Telehealth Nursing

Telemedicine, also known as telehealth, uses telecommunication technology (Internet, wireless, satellite, and telephone) for the provision of medical services and clinical information to distant areas. This type of healthcare is becoming more common. Telemedicine is being used by more than half of all hospitals in the United States. In total, there are 200 telemedicine networks and 3,500 telemedicine stations. The American Telemedicine Association gives guidelines and standards for safe telemedicine practices. There is a difference between health information technologies (HIT) and telemedicine. Communication of patient health information is done through HIT (i.e., electronic health record), while telemedicine is the clinical component of health care. However, HIT can be a part of telemedicine services. The type of telemedicine service dictates whether Medicare and Medicaid pay for the service (American Telemedicine Association, 2016).

There are several main ways telemedicine is implemented. The first way allows the primary care provider (PCP) to make a diagnosis by tele-connection to the patient or patient's specialist. This can be done via live video. Other modes that allow for the PCP to gather data at a later time include video clips and vital signs. Another way of delivering telemedicine is to use information sent from the patient at home for assessment purposes. Glucose readings, vital signs, and electrocardiogram readings can be sent to home health or diagnostic centers. Home health nursing and telemedicine can work in conjunction by using this method. Provision of health information is another capacity of telemedicine. People can learn pertinent health information and be involved with support groups by using the Internet and wireless devices. The last way telemedicine can be used is to facilitate the learning of health care professionals living in rural

areas by delivering continuing education credits and conferences (American Telemedicine Association, 2016).

Telehealth nursing is the provision of nursing care using audio, video, or data technology. Telehealth nursing can be as simple as speaking to a patient over the phone. With phones and the Internet, nurses can receive objective patient information such as blood pressure and blood glucose levels. Another example of how a nurse can utilize telehealth is communication via video. A provider who is not physically at the bedside can use video technology to see and assess the patient with information given by the bedside nurse. In telehealth call centers, nurses can provide expertise in answering patient questions. For instance, a nurse can show a patient over video how to do a dressing change if the patient needs assistance. Patients can also receive education and results through telehealth (American Telemedicine Association, 2011).

A wide variety of applications exist for telehealth. In hospitals, clinics, doctors' offices, prisons, telehealth nursing call centers, and mobile units, patients and nurses are using this type of healthcare. It can also be used by specialty areas of nursing such as the intensive care unit, pediatrics, cardiology, and forensics. Both emergency and non-emergency healthcare can be provided. Examples of emergency telenursing are triage, stroke, and trauma (American Telemedicine Association, 2011).

Benefits of Telemedicine and Telehealth Nursing

There are several benefits of telehealth nursing. The number of hospital admissions and emergency room visits is reduced with telehealth nursing because nurses are able to ask health questions and triage patients using video communications. Since a patient's status can be measured through telehealth (i.e., blood pressure, blood glucose readings), telehealth also helps

patients control chronic diseases. Furthermore, nursing through telehealth allows for the cost of healthcare to be lower (American Telemedicine Association, 2011).

A broad patient population can be reached using telehealth (American Telemedicine Association, 2011). There is a provider shortage around the world. In both rural and urban settings, telemedicine can increase access to healthcare for patients (American Telemedicine Association, 2016). Providers can care for patients not physically in the geographical location. Additionally, nursing resources are used efficiently with telehealth, which can help alleviate the nursing shortage (American Telemedicine Association, 2011). Because of increased access to healthcare and decreased travel time, patients are pleased by telemedicine (American Telemedicine Association, 2016).

Cost Effectiveness of Telemedicine

As mentioned previously, decreased healthcare costs are a benefit of telemedicine. Specifically, travel, staffing, and chronic disease management are areas of healthcare in which telemedicine can conserve financial resources (American Telemedicine Association, 2016). The most recent statistics from 2014 revealed that more AI/ANs (counting those whose race is AI/AN only) live in poverty than any other racial group; 28.3% of AI/ANs live in poverty while 15.5% of other Americans live in poverty. Compared with the national median household income (\$53,657), the median household income for AI/ANs of one race is much lower at \$37,227 (United States Census Bureau, 2015). There is also a lack of funds for healthcare services that are only available to AI/ANs (Meilstrup & Moss, 2016).

A few qualitative studies have implications for the possible cost-effectiveness of telemedicine in AI/AN communities (Doorenbos et al., 2011; Haozous et al., 2012; Hiratsuka et al., 2013). Also, there is a quantitative study measuring the cost-efficiency of telemedicine that

was conducted in a rural area of Pennsylvania (Maeng et al., 2014). The qualitative studies and their implications regarding the cost-effectiveness of telemedicine (Doorenbos et al., 2011; Haozous et al., 2012; Hiratsuka et al., 2013) will be discussed first. Since there is a lack of quantitative literature about the cost-effectiveness of telemedicine within AI/AN communities, the qualitative study, which takes place in a rural setting (Maeng et al., 2014) will also be discussed. Although tribal areas are not where the majority of AI/ANs live, many do live in counties located near reservations and trust lands (United States Census Bureau, 2012). Reservations, where numerous AI/ANs live, are usually remote (United States Department of Health and Human Services, 2012).

According to the results of a qualitative study, rural healthcare providers helping AI/AN people in Alaska and Washington were able to relieve financial burdens related to accessing cancer education through the utilization of telemedicine. The healthcare providers in these regions have difficulty attending educational conferences in urban areas due to numerous financial challenges, such as inadequate funding, travel costs, and replacement staff costs. Through videoconferencing, Native People for Cancer Control Telehealth Network (NPCCTN) supplied information about various cancer topics to 131 providers once a month during lunchtime at rural tribal health clinics. The number of miles the providers were saved from traveling was 60 to 1,100 miles. These providers living in rural areas and helping AI/AN people received continuing education in a manner that saved money because they did not have travel (Doorenbos et al., 2011). Similarly, another qualitative study also conducted research about telemedicine and cancer education for healthcare providers in Alaska and Washington. If local providers are trained by telemedicine to manage cancer pain effectively, specialists may not need to be involved in patient care. Patients would then no longer have to travel to specialists

(Haozous et al., 2012). Telemedicine can relieve the financial burden of healthcare costs, specifically travel and staffing costs (American Telemedicine Association, 2016).

Another qualitative research study also supported the idea that health care costs are decreased with the use of telemedicine based on participants' opinions. Native Hawaiian and Alaska Native people and their healthcare providers, as well as caregivers of Native Hawaiian patients, were participants in this study. Three focus groups included participants from Alaska. Healthcare providers who were not physicians but who delivered healthcare to AI/ANs comprised the first focus group. The second group was made up of healthcare providers and specialists who delivered healthcare to AI/ANs. Patients who went to the Anchorage Native Primary Care Center and who said they had diabetes were the participants in the third focus group. Additionally, the study had three focus groups in Hawaii. In the first group, there were healthcare providers (both physicians and non-physicians) who gave care to patients living on Molokai. Patients who said they had diabetes living on Molokai and caregivers for patients with diabetes living on Molokai made up the second and third focus groups. In these focus groups, the participants answered questions about their opinions of telemedicine (such as the benefits of telemedicine) for diabetes management. The participants' responses were coded for common themes. Telemedicine's possibility of decreasing healthcare costs was a common theme cited by providers and patients as its main benefit. These costs are related to the necessity of traveling to provide or receive healthcare and include transportation, housing, and time. Although this study only researched perceptions of telemedicine and is limited due to other factors, it shows that patients and providers think that the possible decrease of healthcare and travel costs is the main benefit of telemedicine (Hiratsuka et al., 2013).

Geisinger Health Plan (GHP) is a health system located in rural central Pennsylvania. Admission rates, readmission rates, and the total cost of care were the measured variables in a quantitative study that was conducted in order to find out the impact of a telemonitoring system for patients with heart failure in the GHP. The sample studied 541 people with heart failure who were registered for the telemonitoring system anytime between January 1, 2007 and October 31, 2012. An interactive voice response system through Bluetooth and phone technology was the technological tool of the telemonitoring program. Case managers received objective (i.e. weight measurement) and subjective (i.e. complaint of shortness of breath) data through this technology and could then follow up as appropriate (i.e., notifying provider) if symptoms were not within defined limits. This system's goal was to identify patients' symptoms early before there was an exacerbation which may cause the patient to need acute care in a hospital setting (Maeng et al., 2014).

An association between lower hospital admissions and readmissions, and therefore a lower cost of care for patients after participation in the program compared to before their participation in the program, was the expected outcome researchers thought they would find prior to conducting the study. The variables of each patient were compared to before and after participation in the program. The predicted findings of the researchers turned out to be correct. A significant finding was that, during a given month, the probabilities of admission and readmission were lower after the patient participated in the program. Admission was 23% decreased, 30-day readmission was 44% decreased, and 90-day readmission was 38% decreased. The cost savings, which was calculated by subtracting the observed cost from the estimated expected cost of care without telemonitoring, was 11%. Additionally, for every \$1.00 that GHP spent on the telemonitoring program, there was \$3.30 returned to GHP on investment. This study

did have limitations, though, because the regular case management procedure was used in conjunction with the telemonitoring system. Thus, there may have been confounding variables because of the secondary data that were used. However, the study overall demonstrates the economic efficiency of using a telemonitoring system for patients with heart failure (Maeng et al., 2014).

Telemedicine Improves Healthcare Access

Healthcare access for patients is increased through telemedicine (American Telemedicine Association, 2016). Diabetic retinopathy in AI/AN patients is being detected through the Indian Health Service (IHS) Joslin Vision Network, which uses teleophthalmology. This screening is conducted regularly in primary care centers for patients with diabetes. In this screening, retinal images of diabetic patients' eyes are taken by imaging workstations. After receiving the images, the IHS network then assesses the images for retinopathy and other problems. If patients do have retinopathy, the primary care center is notified by the network and the patient's plan of care is appropriately updated. More patients with diabetes are able to have these screenings with the use of this telehealth program than without its use. In 2010, 10,000 patients who never had screenings received them. There is a total of 20 states and 75 stations that have the telehealth equipment available. If caught early enough, treatment for diabetic retinopathy can prevent vision loss. Patient-specific suggestions to help control diabetic retinopathy are sent along with the results of the screening. This telehealth network has increased healthcare access for AI/AN patients with diabetes (Carroll et al., 2011).

Another study demonstrates how health education and support for health problems is being accessed by AI/ANs living in rural areas. In Alaska and Washington, AI/AN cancer survivors and their families/caregivers attended a support group from February 2008 to

September 2009. The meetings occurred at three urban sites in Alaska and Washington which were then broadcasted to a total of 25 tribal sites. These sites are located anywhere from 39 to 1,190 miles away from a support group. During these meetings, information about cancer management was given through a non-telehealth medium and discussions between members occurred through video teleconferencing. Members of the support group could see the main speaker and the members from other sites by way of the video teleconferencing technology. The number of cancer survivors at the monthly meetings varied from 6 to 57 people and a satisfaction survey given at one of the meetings was filled out by 32 survivors. This survey used a Likert scale for six questions related to distance/time for both a non-telehealth support group and satisfaction level with the telehealth support group. Of the 32 out of 50 survivors who completed the survey, the aspect of telehealth that brought the most satisfaction was the ability to talk with survivors from other locations. Through this use of telehealth, survivors living in remote areas were able to obtain cancer support from other survivors even though they were physically distant from each other (Doorenbos et al., 2010). Healing for both the individual and the community is emphasized in AI/AN medicine (Cohen, 2003).

Two other similar studies in which providers of AI/ANs in rural areas of Alaska and Washington received education via telehealth (Doorenbos et al., 2011; Haozous et al., 2012) also support the claim by the American Telemedicine Association (2016) that access to healthcare is increased with telemedicine. In the first study, a total of 368 providers received continuing education about cancer and AI/AN cultural topics from remote sites and discussed questions and concerns with each other through videoconferencing. As previously mentioned in the section on cost efficiency, these providers have difficulty attending conferences for continuing education in urban settings. In order to attend the conference in person, they would have had to travel

anywhere from 60 to 1,100 miles. Through the videoconferencing, however, providers could sit in the comfort of their offices while still obtaining education that will help them deliver quality and cultural-based care to their AI/AN patients. Qualitative findings from the study's 71 returned surveys also indicate that the providers greatly appreciated the opportunity to receive education and communicate with other providers. Through this use of telehealth, providers gained knowledge of cancer and AI/AN culture without needing to travel far distances (Doorenbos et al., 2011).

Similarly, another study done in Alaska and Washington provided cancer pain management education to 93 rural providers in AI/AN communities via telehealth. However, this study compared the self-rated competency level in cancer pain management between providers who did not receive this education to those that did receive it. The number of providers who completed the survey was 32, and the group that did not have education and filled out the survey was also comprised of 32 providers. Both groups were made of providers who help AI/AN patients. A significant result was that, compared to those who did not participate in the telehealth case conferences, the group that did attend them had a higher self-reported competency level in delivery of cancer pain management. Another important outcome of this study was that providers were able to consult with pain management specialists about specific cases without traveling. Thus, some cancer patients indirectly had access to pain management care from specialists (Haozous et al., 2012).

Telemedicine Leads to Patient/Provider Satisfaction

The American Telemedicine Association states that telemedicine is in demand by patients. Reasons for this demand are due to decreased travel times and increased healthcare access offered by telemedicine (American Telemedicine Association, 2016). Specifically, several

studies in the AI/AN community have investigated the satisfaction levels of AI/AN patients and of providers for AI/AN patients (Doorenbos et al., 2010; Doorenbos et al., 2011; Haozous et al., 2012).

As previously mentioned in the study by Doorenbos et al. (2010), AI/AN cancer survivors involved in a telehealth support group provided information about their satisfaction levels with telehealth. The survey included questions about satisfaction levels that participants rated on a Likert-scale. Results of the survey show that the participants were highly satisfied with the telehealth support groups. The opportunity to communicate with survivors from other locations brought the most satisfaction to these participants (Doorenbos et al., 2010).

In another study where providers of AI/ANs did either education videoconferences or case videoconferences, a satisfaction survey was given. Of the providers who filled out the survey, the satisfaction level of telehealth was high (Haozous et al., 2012). Similar to these results, another study that provided telehealth education to providers of AI/ANs also discovered via survey questions on a Likert scale that providers had a high satisfaction level with telehealth (the mean level was 3.6 out of 4). Picture and sound quality of the telehealth system was also rated on a high satisfaction level. Providers rated positive feelings about telehealth before and after participating in the conference via telehealth, and results found that they were increased after this participation. This can be interpreted to mean that satisfaction with telehealth increased once it was experienced (Doorenbos et al., 2011).

How Telemedicine Has Been Used for AI/AN Patients

Telemedicine has been used for AI/AN patients and their providers (Carroll et al., 2011; Doorenbos et al., 2010; Doorenbos et al., 2011; Haozous et al., 2012; Wilshire, 2012). It has been used for support groups and education for AI/AN cancer survivors (Doorenbos et al., 2010).

Telemedicine has provided education and professional case consultation for providers of AI/ANs (Doorenbos et al., 2011; Haozous et al., 2012). It is being used to screen for diabetic retinopathy (Carroll et al., 2011). Not previously mentioned in this discussion, telemedicine has been used for outpatient psychiatric services for Apache patients. Although there were some problems identified with the telemedicine, such as hesitancy of patients to use the service, there were overall benefits such as increased access to mental health services and decreased funds associated with traveling (Wilshire, 2012).

Tele-emergency Care

In order to pave the way for further research in telemedicine, the main effects of tele-emergency care were summarized by a systematic review of the literature. Articles about tele-emergency care in various countries (including the United States) were evaluated for inclusion criteria, and the findings from 38 articles were used. The articles were divided into categories based on where the studies took place and how telemedicine was used: general emergency room (ER), clinics that treat minor injuries, and remote specialist consultation with the ER (Ward, Jaana, & Natafqi, 2015).

Results from the review were grouped into five categories, although not all of the studies could provide data for each of the categories. Technical quality is the first category, and studies report there was good quality of the telehealth equipment overall. The second category is user perceptions of telehealth. Patient and healthcare professional satisfaction with telehealth was high. Emergency room (ER) patients who received specialist care through telehealth said that compared with traveling to see a specialist, they would choose the option of specialty care through telehealth. Clinical processes and outcomes make up the third category and were described according to the setting groups. Overall, telehealth was helpful and accurate for

diagnosis of the patient according to physicians in the studies from the general ER group. The studies from the minor treatment clinic group found that when compared to overall positive outcomes without the use of telemedicine, the outcomes with the use of telemedicine were similar. From the specialist consultation studies, telehealth was shown to be clinically effective for a variety of emergencies (Ward et al., 2015).

Throughput (getting people through the emergency room) and disposition (transfers to other hospitals) is the fourth category. When compared to care without telehealth, telehealth care resulted in a throughput increase, unnecessary transfers decrease, and the same percentage of return emergency room (ER) visits and need for more care for the general ER group of studies. The last category is economic outcomes, and the studies from the specialist consultation to the ER showed that hospital costs were decreased with the use of telemedicine. Due to various reasons such as the variability of the telehealth applications in these articles and the inability to access articles not written in English, this review is limited. However, the conclusions from this review add information to the existing literature regarding telehealth in emergency care and will be discussed next (Ward et al., 2015).

One conclusion the authors drew from this systematic review is that for rural and remote hospitals, studies have shown that specialist care via tele-emergency systems is adequate for meeting patient needs. Additionally, three broad categories of how telemedicine can be used in emergency care were identified from the studies: telemedicine in the emergency room (ER), telemedicine with specialist care in the ER, and telemedicine in minor treatment clinics. Another conclusion is that the problems of access to care (for rural areas) and overcrowding (for urban areas) have the possibility of being lessened with tele-emergency systems in minor treatment clinics (Ward et al., 2015). Assessment of AI/AN health status has revealed that unintentional

injuries are a top cause of death for AI/ANs (Hodgins & Hodgins, 2013). Additionally, there are high rates of assault/homicide and intentional self-harm/suicide for AI/ANs (Indian Health Service, 2016). This review shows that tele-emergency services have the possibility of being beneficial in both rural and urban areas (Ward et al., 2015).

Disadvantages of Telemedicine

One disadvantage of telemedicine is the potential for privacy/confidentiality breaches of medical information. These breaches could occur in the record keeping of recordings/images of health information or in the transferring of this type of information through telecommunication (i.e., satellites). Breaches could also occur during the sending and receiving of information through telecommunication because staff members may be handling the information. Another possible disadvantage of telemedicine is that providers may not adequately account for the informed consent needed to use it. Informed consent means that the patient understands the risks and benefits of a treatment (in this case telemedicine). Elderly patients may not understand the risks related to the technology used in telemedicine. Additionally, there may be unknown risks of technology and telemedicine (Demiris et al., 2009).

The absence of physical touch is another disadvantage if videoconferencing is used to deliver care. This can be considered a major problem, and further research must be conducted in order to determine whether the benefits of telemedicine (i.e., increased access, financial benefits) outweigh the negative of loss of touch (Demiris et al., 2009). Similarly, the study that researched AI/AN and Native Hawaiian patients'/caregivers' and providers' opinions about telehealth found that a common theme in responses was that the loss of face-to-face communication and physical touch between patient and provider was a disadvantage of telemedicine. The difficulty in forming a relationship with the provider through telehealth was a chief concern for the patients.

The inability for a thorough assessment and the possibility of overlooking a problem when using telehealth was a chief concern for the providers. The providers also thought a disadvantage of telehealth was difficulty in the interpreting of non-verbal communication of the patient. Another disadvantage according to some of the providers from this study was poor quality of teleconnection (Hiratsuka et al., 2013).

Overcoming the Obstacles of Telemedicine

Although there are obstacles of telemedicine, there are actions that can be taken to overcome them. A way to overcome the obstacle of possible privacy/confidentiality breaches of patient health information related to telehealth is to make policies. These policies must fulfill both state and national laws regarding patient health information. An example of a national set of laws that must be followed is the Health Insurance Portability and Accountability Act. Some of the types of telehealth information protection policies would have to include the aspects of business, computer (i.e., images, recordings), and communication lines (i.e., telephone, satellite). Once there are policies in place to secure health information, healthcare professionals can explain the policies for patients to have control over their health information. This concept worked well for a telehealth support group for AI/AN cancer survivors who were using videoconferencing to speak to survivors in other places in Alaska, made possible by the Native People for Cancer Control Telehealth Network. The members of the support group were told that the telehealth conference would not be recorded. Additionally, video technology was thoroughly explained to the members. They learned that the view they could see on the video screen was the same view the members from other sites could see. Thus, if members did not want participants from other sites to see them via the video, they could sit in a place that would ensure this did not

occur. The survivors had very meaningful conversations with survivors from other locations after the privacy/security concerns were explained (Demiris, et al., 2009).

Continual explanation of informed consent can overcome the potential disadvantage of improperly handling informed consent in the use of telehealth. Since telehealth treatment occurs over time, features should be continually explained to the patient. Family members and caregivers should also receive information and give informed consent when telehealth is used in the patient's home. Sustainable healthcare is necessary to avoid the possible disadvantage of patient inability to access telehealth because of a lack of resources. The Native People for Cancer Control Telehealth Network created a sustainable system for telehealth usage in tribal clinics. The telehealth system increased the profits for the clinics because the types of patients that could be seen expanded. Specialists from other locations consulted with local providers about patients, who without telehealth would have needed to travel hundreds or thousands of miles to be seen by specialists. The increased profits for the clinics resulted from the ability to see more patients with specialized care needs. The telehealth system then achieved the potential for sustainability (Demiris, et al., 2009).

Telehealth's inability to facilitate human touch is a disadvantage that could be addressed or considered differently according to the situation. Specialized care that would not have been delivered without telehealth (due to winter weather) was provided to AI/AN patients in local clinics in Alaska (Demiris, et al., 2009). Another theoretical solution to the problem of a physical patient-provider relationship is to use telehealth as an adjunct to an existing relationship (Demiris, et al., 2009; Hiratsuka et al., 2013). A meeting between patient and provider before using telehealth would be helpful for forming a patient-provider relationship according to the responses from AI/AN and Native Hawaiian patients, caregivers, and providers of these patients.

The participants in the study also thought that when using telehealth, the same provider should give care to the patient every time (Hiratsuka et al., 2013). Communication training for providers giving care to patients via videoconferencing was a realistic way the NPCCTN worked to evade this disadvantage. Small talk and showing empathy were some of the communication strategies taught to the providers (Demiris, et al., 2009).

Telemedicine has the disadvantage of not being able to deliver physical touch (Demiris et al., 2009) and personal connection (Hiratsuka et al., 2013). Telemedicine has no bearing on the concept that the relationship between the patient and provider is the key to successful healthcare in general, according to the opinions of AI/ANs and Native Hawaiians and the providers. Quality communication, cultural awareness/sensitivity, and respect/caring were the themes identified as being essential for the patient-provider relationship (Hiratsuka et al., 2013).

Additionally, the patients who participated in this study reported that one of the aspects of quality communication was being able to understand what the provider was saying in lay terms. Also, the provider's action of listening to the patient was considered an important part of communication (Hiratsuka et al., 2013). Cohen (2003, 39) explained the importance of listening with what he called a "silent mind", meaning that one does not judge what the other person is saying. He also emphasized that being frugal with the number of words spoken and being careful about not giving a name to the disease aloud are essential to the healing process in AI/AN cultures (Cohen, 2003). Clarifying and making sure patients understand their care were ways providers suggested that miscommunication could be avoided when helping AI/AN and Native Hawaiian patients (Hiratsuka et al., 2013). Providers for Native Hawaiians and AI/ANs also reported that it is beneficial to have insight and education about the cultural background of the patients for whom they provide healthcare (Hiratsuka et al., 2013).

Overall, cultural background should be understood by providers giving care to Native Hawaiian and AI/AN patients (Hiratsuka et al., 2013). There are numerous examples of the cultural beliefs and traditions of AI/AN people (Cohen, 2003; Hodgins & Hodgins, 2013; National Library of Medicine, n.d.). As previously discussed, relationships are very important to AI/AN people. The group, but not individual, efforts are valued. Although elderly AI/ANs are respected and given decision-making abilities, everyone is allowed to speak for himself or herself and children also are given autonomy. The concept of time is unstructured (Hodgins & Hodgins, 2013). The belief in a Creator or Great Spirit is a spiritual value. Another spiritual belief related to health is that balance with nature is needed for having good health (Cohen, 2003; Hodgins & Hodgins, 2013). Disease has an opportunity to manifest when one is out of this balance with nature (Cohen, 2003).

In the opinions of AI/AN and Native Hawaiian patients, caring and respect were necessary components for care given with or without telemedicine. A provider who made talking with the patient a priority was utilizing one way to show care. Another way to show care was to explain information to the patient and make sure he or she understood it. A third way providers showed care to patients was to take his or her time with the appointment and avoiding a hasty attitude (Hiratsuka et al., 2013). In AI/AN culture specifically, respect can be given to another person by listening (Cohen, 2003).

Implications for Healthcare Practice

Based on a review of the literature, there are several implications for healthcare practice. The implications that will be discussed first relate to the possible benefits of telemedicine in the AI/AN population. One implication is because of telemedicine's possible cost effectiveness benefit, telemedicine may be advantageous for AI/AN healthcare because of the financial

problems (both in general and related to healthcare) in this population (American Telemedicine Association, 2016; Doorenbos et al., 2011; Haozous et al., 2012; Hiratsuka et al., 2013; Maeng et al., 2014; Meilstrup & Moss, 2016; United States Census Bureau, 2015). Another implication is that access to healthcare, which is a problem for the AI/AN population, may be helped with the use of telemedicine (American Telemedicine Association, 2016; Boccuti et al., n.d.; Carroll et al., 2011; Demiris et al., 2009; Doorenbos et al., 2010; Doorenbos et al., 2011; Haozous et al., 2012; Kim, Bryant, Gains, Worley, & Chiriboga, 2012; Martin & Moss, 2016; United States Department of Health & Human Services, 2012). It would especially be useful for situations where there are no other options available (Carroll et al., 2011; Demiris et al., 2009). The third implication is because of the satisfaction with telemedicine of both patients and providers, telemedicine may be a beneficial asset to AI/AN healthcare (American Telemedicine Association, 2016; Doorenbos et al., 2010; Doorenbos et al., 2011; Haozous et al., 2012; Ward, et al., 2015). The last implication is telemedicine usage for emergency care could help meet the specific healthcare needs of AI/AN people (Bureau of Indian Affairs, 2017; Hodgins & Hodgins, 2013; Indian Health Service, 2016; Martin & Moss, 2016; Ward et al., 2015; United States Census Bureau, 2012).

Other implications relate to how to overcome the disadvantages of telemedicine in the AI/AN population. The first implication is the potential ethical issues of telemedicine should be addressed in a variety of ways (Demiris et al., 2009). The second implication is because telemedicine cannot provide a physical, human presence, knowledge and respect for AI/AN cultures is necessary for a positive experience with telemedicine (Cohen, 2003; Hiratsuka et al., 2013; Hodgins & Hodgins, 2013; Moss, 2016b; Moss, 2016c; National Library of Medicine, n.d.). The third implication is since the relationship tone between patient and healthcare provider

impacts the way healthcare is received, understanding AI/AN culture would be advantageous for those who deliver healthcare to AI/ANs through telemedicine (Cohen, 2003; Hiratsuka et al., 2013).

Conclusion

In summary, it is possible for the healthcare problems and disparities of American Indian and Alaska Native people to be helped with telemedicine/telehealth. The American Telemedicine Association (2016) defines telemedicine as healthcare given to patients in other locations through the use of technology communications (i.e. computer, phone). The possible benefits of telemedicine include: cost effectiveness, increased access to healthcare, and satisfaction of patients and providers (American Telemedicine Association, 2016). There are some disadvantages of telemedicine; one of them is a loss of physical proximity and touch (Demiris et al., 2009; Hiratsuka et al., 2013). However, a caring attitude and being knowledgeable about American Indian and Alaska Native cultures can aid the use of telemedicine within this population.

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