



Published in final edited form as:  
*J Cult Divers.* 2009 ; 16(1): 32–35.

## State of the Science: A Cultural View of Native Americans and Diabetes Prevention

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### Abstract

The purpose of this article is to present a review of the literature on diabetes type 2 prevention interventions for Native American populations. The interrelation of the cultural role of food in Native American diets, educational policies related to food, outcomes of federal policies, and the historical background of diabetes are addressed. In addition, published studies of diabetes prevention interventions with Native American populations are examined. Lastly, exemplars of programs that represent best practices in the prevention of diabetes are described.

### Keywords

Native America; Type 2 Diabetes; Prevention Programs; Cultural

### Introduction

Much has been written about American Indians and Type 2 diabetes. Search engines bring up hundreds of articles and internet sites on this topic. How do these published reports really impact diabetes prevention for Native Americans? Has what is known gone from awareness to intervention to success in preventing diabetes? The purpose of this article is to present a review of the pertinent published literature about the prevention of Type 2 diabetes (hereafter called diabetes) among Native Americans and to highlight exemplar programs and empirically tested interventions in the literature that could make a difference. The impetus for this process is the authors' work as Co-Directors for the nursing research training core of the American Indian Diabetes Prevention Center. The mission of the American Indian Diabetes Prevention Center is to prevent or delay the onset of diabetes in American Indians and Alaska Natives. The goal of this project is to teach tribal nurses, who work with Native Americans, about research methods, the process of implementing evidence-based practice, and the ethical conduct of research in the practice setting. In learning about any issue, it is important to review its historical background.

### History of American Indian Health in America

Native Americans have a rich history of healthy food systems and prosperous agricultural economies. By 800 A.D., North American Indian farmers from Florida to Ontario, Canada were cultivating several crops and developing varieties that were appropriate for the growing season where they lived (Keoke & Porterfield, 2002). Explorers landing in the so called "new world" marveled at the abundance of agricultural crops and the advanced

agricultural technology. As a result, many explorers and settlers were aided by Indian farmers' bounty (Keoke & Porterfield, 2002).

This changed as colonization was established and the Indigenous people were pushed out of their traditional homelands, subject to war and disease and finally, containment on reservations or city slums. Surveys of Native American diets from the 1920s into the 1950s found staples of canned meat and fish, bread, beans, sugar, and coffee or tea (Prucha, 1986). On many reservations, malnutrition and nutritional deficiencies were endemic. Despite recommendations to improve Native American diets, food aid provided to the tribes was usually insufficient and of low quality. Also, the food aid did not include traditional foods, leading to further deterioration in health. The history of food insecurity for Native Americans that began with the establishment of reservations continues today. Until the 1950s, malnutrition and hunger were the primary food issues facing tribes (Prucha, 1986). After the 1950s, Native American dietary patterns were increasingly dictated by “the arrival of welfare checks and the distribution of government commodities” (Bass, 1974 p.37). To the contrary, despite the increase in federal food aid, Native American diets remained inadequate to their needs.

By the 1960s most Native Americans had diets similar to those of the non-Indian population. This trend continues. For example, documented reports indicate that as recently as the late 1990s, almost one-fourth of Native American households were food insecure, meaning that they did not have access to enough food to meet their basic needs and one out of twelve experienced food insecurity coupled with hunger (Henchy, Cheung, & Weill, 2002).

Access to food is complicated by the geographic isolation of many reservations and Native communities. The failure of federal food programs to include or support the continued use of traditional foods has contributed to the reliance of Native Americans on less healthy foods and culturally inappropriate patterns of consumption (Bell-Sheeter, 2004).

## Educational Policy

Food is more than sustenance to put into the body. For Indigenous people, it is intricately tied to land, ceremony, family, and spirituality. At the same time the food system was being dismantled by the reservation system and movement of the people off of their traditional lands, the family system was being completely disrupted by the destruction of the traditional clan and its teaching systems. Examples of the disruption of the family include the abrupt changing of roles for tribal members and outlawing their practice of religion and language. With the assault on religion and language, broken hearts resulted with the removal of their children to boarding schools to be instructed in Christianity and “civilized ways” for assimilation into the majority culture for the purpose of providing a working-class labor force to benefit society.

Education was quickly identified as a critical tool in accomplishing this goal, but not education as practiced today. This education was menial and focused on developing skilled labor. To accomplish this goal, Native American children were removed from their families as early as kindergarten levels and kept in these boarding schools until adulthood. This assimilation policy advocated by Richard Pratt's group, the Friends of the Indians, was comprehensive and compulsory (Clarke Historical Library, 2009). Schools were created that isolated the students from their tribal cultures and attempted to fully assimilate the students into a European lifestyle. The vision of Indian education was built upon military subjugation to achieve cultural assimilation. Its founder, Richard Pratt, started the first school at an abandoned military post at Carlisle, Pennsylvania and its practices were based on an Indian prison that he had overseen in Florida (Clarke Historical Library, 2009). The General Allotment Act of 1887, more commonly referred to as the Dawes Act, incorporated the

Carlisle model into government policy. Every head of Indian Education had a variation of this theme. Estelle Reel, who was the head of Indian Education from 1901 to 1910, was guided by the principle that actual instruction for Native American children was to be secondary. On the other hand, industrial training was the primary goal of Indian education (Clarke Historical Library, 2009). Most of the so called educational programs for Native Americans were predicated on this premise. For example, in 1901 Reel instituted a curriculum that focused on teaching agricultural skills, with little academic instruction. Reel was fairly explicit in stating the assumption that Native Americans would never advance beyond the lower economic strata of American society (Clarke Historical Library, 2009).

While there may be the impression that this attitude of low educational expectations for Native American students is past history, its presence continues as evidenced by the very low numbers of Native Americans who graduate from high school, even fewer who go to college and achieve higher degrees. The massive effort to recruit Native Americans and other minorities into higher education does little to address the underlying fact that they may be entrenched in a system (or systems) that places them in a lower tier of expectation and shunts them away from higher education and leadership positions at a very early age. Societal expectations are also subliminally present in everyday activities, working to maintain suppression and oppression and low expectations.

### **Outcomes of Federal Policy Toward Native Americans**

For America's Indigenous people of the last century, the land was gone, the food was gone, and the Native American family structure was gone. Native Americans were deprived of their religion and they were uneducated and the poorest of the poor. This culminated in the mid-nineteen hundreds. After centuries of federal and state policies of termination, removal, and assimilation, Native Americans were substantially worse off than white American society. Yet, the fact that tribal nations endured and survived, some have even thrived, is a testament to their resilience and strength. The changing policies of the 1970's, 1980's, and 1990's reinvigorated tribal self-governance and its ability to direct its own destiny and that of its people. Yet, much damage had been done. The United States Commission on Civil Rights Report, *Broken Promises: Evaluation the Native American Health Care System* (2004) found that Native Americans experience a significantly lower health status and disproportionate rates of disease compared with all other Americans. Furthermore, The United States Commission on Civil Rights Report attributes the current health and illness states to these policies and states the following:

This is the result of the nation's lengthy history of failing to keep its promises to Native Americans, including the failure of Congress to provide the resources necessary to create and maintain an effective health care system for Native Americans...and cultural, social, and structural barriers continue to exist and limit Native American access to health care (2004, p. iii).

This is no more starkly indicated than the reported per capital health care expenditures for 2003 by the U.S. Department of Health and Human Services (USDHHS). According to the USDHHS, in 2003 the per capita spending for health was \$5,065. Spending for each federal prisoner and was \$3,803, and the federal allotment to Indian Health Services for medical care was \$1,914 (United States Commission on Civil Rights Report, 2004, p. 98). Hence, spending priorities on health may be directly linked to access to care and health outcomes. These facts are directly linked to the limited resources allotted to Indian Health Services and diabetes prevention strategies.

## Brief Historical Background of Diabetes and Native Americans

Diabetes in the Native American population was virtually unknown in 1940. Diabetes started in the 1950's and its increasing frequency was noted in the mid-1960's literature (Szathmary, 1994). Diabetes mellitus is characterized by the presence of higher than normal levels of glucose in the blood. Until 1980, there was no universal agreement on the level of glucose that constituted abnormality, so diagnostic standards varied nationally and internationally, complicating the diagnosis process (Szathmary, 1994, p. 458). The Pima tribe has been studied longitudinally since 1963, and their prevalence of diabetes was found to have increased 42 percent in the period between 1967 and 1977 (Carter, Horowitz, Wilson, Sava, Sinnock, & Gohdes, 1989). Acton, Burrows, Moore, Querec, Geiss, & Engelgau (2002) found that between 1990 and 1998, diabetes prevalence among American Indians and Alaska Natives younger than 35 years increased by 46 percent. The largest increase was among young American Indians which represented almost two times that of the total Alaska Native population (Acton, Burrows, Moore, Querec, Geiss, & Engelgau, 2002, p. 1488). These epidemiological trends are based on the Indian Health Service database for outpatient visits for the time periods cited. The Indian Health Service (IHS) provides care to a service area population comprised of approximately 57 percent of the U.S. Indian population, and its service population increases at a rate of approximately 2.0 percent per year (Indian Health Service, 2009).

More recent reports indicate that 16.3 percent of American Indian and Alaska Native adults are diagnosed with diabetes compared with 8.7 percent of non-Hispanic whites. It is estimated that an additional 30 percent of American Indian and Alaska Native have pre-diabetes. There has been a 68 percent increase in diabetes from 1994 to 2004 with 95 percent of the diagnoses representing diabetes type 2. There has been a 58 percent increase in diabetes prevalence among AI/AN ages 20-29 from 1990-1998 compared with 9.1 percent of the general population (National Diabetes Education, 2008). In 2004, the death rate due to diabetes for American Indian and Alaska Native was three times higher than the general population. It is estimated that diabetes can shorten a person's life span by fifteen years. Moreover, the average annual medical care cost for the person with diabetes is \$13,243, compared to the average cost of \$2,560 for a person without diabetes (National Diabetes Education, 2008). In addition, total diabetes rates vary from 6.0 percent among Alaska Natives to 29.3 percent among American Indians in southern Arizona (National Diabetes Education Program, 2008). It is vital to the continued survival of tribal nations that this condition be avoided. The effort put forth by many groups has resulted in some successes.

## Studies of Diabetes Prevention Interventions with Native Americans

The literature search to locate studies of the efficacy of diabetes type 2 prevention interventions among Native American populations involved several strategies. First, Native American researchers and clinicians were contacted for sources of information about published diabetes prevention intervention programs. Secondly, the Medline database and the Western History Collection at the University of Oklahoma were included in the literature review. This review does not include dissertations, books, or newsletters.

Although, diabetes type 2 is a major contributor of morbidity and mortality among Native American populations, few diabetes prevention clinical trials were reported in the research literature. For example, from 1990 to 2008, fifteen reports of diabetes intervention studies were identified. Three studies demonstrated long-term effective outcomes. Ten studies were primarily descriptions without evaluation outcomes.

Using a randomized controlled clinical trial, Thompson, Allen, Helitzer, Qualls, Whyte, Wolfe and Herman (2008) examined the effectiveness of a culturally influenced, low

intensity lifestyle intervention with 200 urban Native American females aged 18 through 40. The intervention group received a five month program that consisted of monthly discussion groups aimed at healthy eating, physical activity, setting goals and social support. The researchers found that the intervention group significantly increased their mean intake of vegetables and fruits over the intake of the control group. Both the intervention and control groups demonstrated significant decreases in waist circumference, insulin sensitivity, total blood cholesterol, saturated fat and sugar intake (Thompson, Allen, Helitzer, Qualls, Whyte, Wolfe and Herman, 2008).

In 1999, the Eastern Band of Cherokee Indians developed and implemented a culturally competent community-based intervention called Cherokee Choices (Bachar, Lefler, Reed, McCoy, Bailey, and Bell, 2006). The Eastern Band of Cherokee Indians lives in the Great Smokey Mountains of North Carolina. The goal of the Cherokee Choices intervention was to prevent diabetes type 2, especially among children. The key components of the Cherokee Choices community-based intervention included an elementary school mentoring intervention, an adult worksite wellness intervention, and a church-based health promotion program. Indicators of successful outcomes of the Cherokee Choices intervention were the obtainment of dietary and physical activity benchmarks, and decreases in body mass indexes. Psychosocial indicators for the children who participated in the mentoring intervention reported increased interest in school and grades, fewer days of school missed and fewer conflicts (Bachar, Lefler, Reed, McCoy, Bailey, and Bell, 2006).

In another community-based intervention, researchers tested the effectiveness of the Ho-Chunk Youth Fitness Program. Carrel, Meinen, Garry and Storandt report that this program was designed to examine the efficacy of a 24-week intervention with supervised classes in nutrition and exercise. The intervention population included both native and non-native American youth ages 6 to 18. Mean fasting plasma insulin levels decreased significantly for the intervention population. In fact, the researchers concluded that supervised nutrition and exercise classes were effective in reducing the risk for insulin resistance and type 2 diabetes (Carrel, Meinen, Garry and Storandt, 2005).

A culturally sensitive intervention was the focus of the Sandy Lake School-based diabetes prevention program. Saksvig, Gittelsohn, Harris, Hanley, Valente, and Zinman used as pretest-posttest, single sample design to study the effectiveness of a diabetes prevention program aimed at changing dietary intake behaviors and dietary self-efficacy. The outcomes included significant increases in dietary intention, preference, knowledge, and dietary self-efficacy (Saksvig, Gittelsohn, Harris, Hanley, Valente, and Zinman, 2005).

In one long-term study, the investigators did not achieve significant outcomes in diabetes prevention. Paradis, Levesque, Macaulay, Cargo, McComber, Kirby, Receveur, Kishchuk and Potvin (2005) reported on the impact of the Kahnawake School Diabetes Prevention Project, an 8 year elementary school-based diabetes prevention intervention program in the Mohawk community. Over time, the researchers concluded that the study population did not show continued participation in physical activity and fitness (Paradis, Levesque, Macaulay, Cargo, McComber, Kirby, Receveur, Kishchuk and Potvin, 2005).

## Best Practices in Diabetes Prevention Programs

The literature review revealed five best practice programs focused on diabetes prevention. All five programs were selected by the Indian Health Services. The first program, The Trimdown Program, is sponsored by the Albuquerque Service Unit and is a six-week intervention aimed at assisting participants to incorporate healthy eating habits and physical activity with the support of others (Indian Health Service, 2006).

A second program, the Lifestyle Balance Program sponsored by the Gallup Medical Center, is a twenty-two week comprehensive program that adheres to the Diabetes Prevention Program curriculum. Participants meet weekly and individually with a coach on a regular basis. This program includes problem identification and solving, positive thinking and tools for stress management (Indian Health Service, 2006).

In the third program, the Lionel R. John Health Center-The Seneca Health Trail Blazers-Trails of the Iroquois, the participants attend weekly sessions for support. The progress of each participant is tracked. Using a clan animal, the participant's progress is tracked by moving the animal across a map of the state of New York and along a trail from the tribal territory to other tribes across the state. Participants receive beads and leather to make a bracelet or necklace for weight loss (Indian Health Service, 2006).

The fourth program, the Red Lake Band of Chippewa Indians-Weight Management Program, is community-based and meets twice a week for six to eight weeks. The focus is on lifestyle change and group support. Lastly, the fifth program, Fresno Native American Health Centers-Greatest Loser Program, incorporates behavior modification, spiritual and mental health approaches in this ten week wellness program for Native Americans who live in an urban area.

## Recommendations for Future Diabetes Prevention for Native Americans

Although, there are many epidemiological articles of diabetes among Native Americans, there is a paucity of studies on effective interventions. Moreover, the diabetes prevention programs reported in the literature are primarily descriptions. Therefore, more studies that evaluate the effectiveness of culture-specific diabetes prevention interventions with Native American populations are needed.

## Acknowledgments

**Disclaimer:** The University of Oklahoma Health Science, Center American Indian Diabetes Center project described was supported by Award Number P20MD000528 from the National Center on Minority Health and Health Disparities. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Center on Minority Health and Health Disparities or the National Institutes of Health.

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