



History: A determinant of diabetes in an American Indian nation

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Abstract

American Indians and Alaska Natives are at an increased risk of developing type 2 diabetes and are more likely than the general U.S. population to suffer from diabetes-related complications. Although the association among diet, physical activity, and diabetes are well established, the social determinants of health provide another explanation of the disproportionate risk of diabetes and diabetes-related disparities among American Indians. Few studies have examined other contributing factors, such as colonisation. In this study, a critical Indigenous framework that includes historical events and policies as primary social determinants to explain diabetes-related disparities within a contemporary American Indian/Alaska Native context was applied. Twenty-eight interviews were conducted with citizens of an American Indian nation to examine the relationship between local history and diabetes. Drawing from this data, a new framework is provided to understand the root causes of the diabetes epidemic that has meaningful application to public health.

Keywords: American Indians, diabetes, history, social determinants of health

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Introduction

Type 2 diabetes (hereinafter *diabetes*) remains an important concern for American Indian nations, as they experience some of the largest rates and prevalences compared to their counterparts in the United States. Nearly 7.4% of non-Hispanic Whites have diabetes compared to 15.1% of the American Indian population (Centers for Disease Control and Prevention, 2017). American Indians are also more likely than the general U.S. population to suffer from diabetes-related complications such as kidney failure (3.2 times higher; Indian Health Service, 2018). The links between diabetes risk and its prevention and management with regard to diet and exercise are robust (Hoskin et al., 2014; Jiang et al., 2018). However, diabetes and diabetes risk are also consequences of the social determinates of health: “the conditions in which people are born, grow, live, work, and age” (Commission on Social Determinants of Health [CSDH], 2008, p. 1) that shape health.

The social determinants are central to health, and they are useful in understanding the social contexts that shape the health and health behaviours of individuals. Previous research has highlighted the impact of social conditions on health that include factors such as education, income and wealth, race and racism, neighbourhood, work, and living conditions (Braveman et al. 2011). For example, the physical environment in the form of features such as sidewalks, parks, and supermarkets may affect health by influencing health risk behaviours that contribute to diabetes (Bilal et al., 2018; Booth et al. 2005; Den et al., 2018; Thorton et al., 2016; Morland et al. 2006; Sallis & Glanz, 2006). Although these determinants are important to American Indian (AI) health. They do not consider other fundamental factors that influence health, such as colonisation and history (Chowkwanyun, 2011; Walters, Mohammed, et al., 2011). As Chowkwanyun (2011) argues, “the major shortcoming in racial health disparities research is an absence of an historical perspective that would enable exploration of historically rooted ‘fundamental causes’”(p.254) and that “what is missing ... is a deeper understanding of how and why these social determinants of racial health disparities matter so much, the long-term process through which they came into being” (Chowkwanyun, 2011, p. 254).

Considering colonisation and history through a social determinants lens affords a holistic view and understanding of current AI health. Diabetes research that focuses on obesity, nutrition, physical activity, and other behaviours “obscures social and historical issues that are even more fundamental to the etiology of the disease” (Ferreira & Lang, 2006, p. xix). In addition, Walters, Beltran et al. (2011) stress the need to investigate “how AIAN health outcomes can be contextualized and understood in light of historical losses and disruptions tied to place or land” (p. 166). AI nations were subject to traumatic and genocidal policies whose effects continue today (Evans-Campbell, 2008; Gracey & King, 2009; King et al., 2009). As a result, colonisation and history are essential determinants of American Indian health.

Social Determinants of Health

A large and growing body of literature supports the social determinant of health that are the fundamental structures of social hierarchy and the socially determined conditions in which people live, work, grow, play, and age; they are the *causes of the causes* (CSDH, 2008). The determinants are the result of the unequal distribution of resources, power, income, goods, and services, leading to unfair circumstances in people’s lives and ultimately diminishing chances of a flourishing life. For example, poverty may influence access to job opportunities and resources such as high-quality schools, health care, and effective policing that may, in turn, affect health. In addition, living in an impoverished neighbourhood is associated with negative health effects; these include mortality, poorer physical and mental health outcomes, and negative health behaviours (Andersen et al., 2018; Kimmel et al., 2016; Mode et al., 2016; Singh et al., 2017).

The social determinants matter for health and are necessary for a deeper understanding of societal inequities (Alvidrez et al., 2019; Burton et al., 2011; Cummins et al., 2007; Palmer et al., 2019; Popay et al., 1998, 2003; Solar & Irwin, 2010) and also highlight avenues for intervention (Jernigan et al., 2018; Warne & Westcott, 2019; Thorton et al., 2016). In 2015, the National Institutes on Minority Health and Health Disparities held a series of workshops to identify promising research directions needed in order to gain a better understanding of how social determinants contribute to health disparities (Palmer et al., 2019); what mechanisms explain why population groups disproportionately experience disease and health-related burdens? Among the directions included understanding the contributions of upstream, or structural, social determinants of health such as government policies. Specifically, a) clarifying how upstream determinants, such as government policies as an example, influence pathways leading to health disparities, b) how policies lead to steps that limit and restrict, resulting in health disparities, c) how governance and legislation contribute to structural challenges that create barriers impacting health and health behaviours, and d) research that considers racism and discrimination (Palmer et al., 2019). For AIs, colonisation and history, including past

governmental policies, as upstream social determinants should be considered in order to better understand how health and health behaviours came into being.

Colonisation and History Through a Social Determinant of Health Lens

Many American Indian health disparities, including diabetes, are associated with colonisation and, consequently, historical trauma (Ferreira & Lang, 2006; Gracey & King, 2009; King et al., 2009; Kirmayer et al., 2014; LaDuke, 1999; Stephens et al., 2005). Brave Heart (2003) defined historical trauma as the “cumulative emotional and psychological wounding over the lifespan and across generations, emanating from massive group trauma experiences” (p. 7) and the impact of a generation’s trauma on subsequent generations. While Hartman and Gone (2014) present four characteristics of historical trauma based on previous research:

Colonial injury to Indigenous people as a consequence of experiences with conquest, subjugation, and dispossession by European and Euro-American settlers is the basis of the concept; *Collective experience* of these injuries by entire Indigenous communities or collectivities whose identities, ideals, and social lives were impaired as a result is highlighted; *Cumulative effects* of these injuries from continued oppression that have accumulated or ‘snowballed’ over time through extended histories of harm by dominant settler-colonial society is accentuated; and *Cross-generational impacts* result from these injuries as they are transmitted to subsequent generations in unremitting fashion in the form of legacies of risk and vulnerability to behavioral health problems until healing has occurred (p. 275)

In addition, historical trauma includes the following postulations: a) trauma was methodically and purposely inflicted on AI; b) trauma is not limited to past injustices but continues in the present; c) traumatic experiences are universal to a group and echo all the way through that population; d) traumatic experiences from the past disrupted the natural historical course and have created physical, psychological, social, and economic disparities (Sotero, 2006); and e) psychosocial, social, and

physical consequences that result from historical trauma are passed on from previous generations and continue through subsequent generations (Brave Heart & DeBruyn, 1998; Evans-Campbell, 2008; Sotero, 2006). For example, much of Brave Heart’s work explores the impact of historically traumatic events on mental health among the Lakota; the symptomology includes unresolved mourning, feeling numb in response to current traumatic events, anger, and depression (Brave Heart, 1999a, 1999b, 2000; Brave Heart & DeBruyn, 1998). Additionally, Evans-Campbell (2008) argues that individual responses to historical trauma affect mental and physical health, with individuals exhibiting symptoms such as post-traumatic stress syndrome, guilt, anxiety, grief, and depression. Stress and depression are risk factors for type 2 diabetes and other health risks (Brotman et al., 2007; McEwan, 1998; Mezuk et al., 2008).

Since contact with Europeans, AI people experienced epidemics, forced relocation, and assimilation policies that have profound and lasting impacts on AI people today. Many current day practices, including food practices, can be traced to colonisation that includes historical governmental policies. In the 1850s, United States federal Indian policy forced many AI nations to live on reservations. Some AI nations had reservations established on their ancestral homelands, while others lost land or were displaced. Reservations restricted the ability of AI people to hunt, gather, and engage in agriculture. In addition, many AI nations were introduced to and forced to take food rations, replacing their traditional diet. The effects of reservations and the introduction of rations disrupted their way of life, changing not only their living conditions but almost all areas of their life, including their diet and activity levels (Ferreira & Lang, 2006; LaDuke, 1999; Walters, Mohammed, et al., 2011). While diet, exercise, and the social determinants of health largely contribute to diabetes risk, the effects of colonisation are devastating and cannot be ignored (Ferreira & Lang 2006; Walters, Beltran, et al. 2011; Walters, Mohammed, et al. 2011).

Methods

This paper resulted from a section from my dissertation that examined relationships among

Indigenous knowledge, land, local history/historical trauma, and diabetes within an American Indian nation using an explanatory, single-case study approach, supplemented by in-depth interviews. An examination of the history, the stories, and the experiences of the participants highlight how life has changed as a result of colonisation and provides insight into diabetes today. The overall research questions from the dissertation were 1) How is diabetes constructed or understood by the citizens of the tribal nation? And 2) How does place, including Indigenous knowledge, meaning of land, and the experiences of colonisation including local history and historical trauma, relate to diabetes? The results presented in this paper are from the history section of the larger study.

This research was developed by the author and guided by Indigenous and non-Indigenous scholars, in addition to elders from the study setting. The study was funded by a scholarship from the author's tribe and through a fellowship with the Robert Wood Johnson Foundation Center for Health Policy at the University of New Mexico, Albuquerque. The tribe's Division of Health Programs, Health Advisory Board, the Tribal Council, and the University of New Mexico Human Research Protections Office (HRPO #: 11-548) approved the study.

Setting

An American Indian nation located in rural Arizona served as the case for this research. The reservation covers 1.6 million acres with approximately 13,000 individuals (Arizona Department of Health Services, 2020). Historically, the tribal nation was semi-agricultural and semi-nomadic; they grew crops such as corn, sunflowers, beans, squash, and wild plants. They also hunted deer, elk and other game, and collected wild plants. In 1869, when the U.S. Army encountered the tribe, a colonel made that observation that they were “perfectly healthy” (White Mountain Apache Tribe, n.d, para. 6).

Data Collection and Analysis

Semi-structured interviews were conducted to address the research questions. Being from the community, I am familiar with the history and culture that helped me gain access to, and the trust of community members. I approached

potential key-informant interview participants in person or by phone, provided a brief verbal description of the study, and asked if they would like to be interviewed. Individuals who expressed interest were given a copy of the written consent form. I then re-contacted individuals within a few days to see if they were still interested in participating. Interviews were scheduled at participants' earliest convenience and at a location chosen by the participant.

Initially, I used purposeful sampling of key informants and snowball sampling based on key informant recommendations. Key informants included elders and individuals working with culture and language within the respective tribal community. For example, two members of the tribe's cultural advisory board consented to interviews. One of the members holds a PhD in American Indian Studies and works with language revitalisation, while the other works primarily with repatriation. Both of these individuals guided me throughout the research process. Subsequent study participants included several tribal council members, traditional craftspeople, and people from the general tribal population. Participants were recruited and screened for eligibility by phone and in person. All participants gave informed consent prior to beginning the interview and were compensated with twenty dollars. A total of 28 interviews were conducted when saturation was reached.

Interviews were professionally transcribed and verified for accuracy and placed into ATLAS.ti (Version 7). Interview transcriptions essentially were verbatim records; however, some quotations were slightly edited for comprehensibility. Participants were then given pseudonyms to protect their identities. Using a grounded theory approach, I read, analysed, and interpreted the interview data. Categories or themes that emerged from the data were defined and coded (Corbin & Strauss, 2008).

Results

Our people are descendants of ancestors that were here that did not have these types of disease before what we call ‘The Arrival.’ The ancestors did not have immunity against certain things that were brought over by the early Europeans—the Conquistadors and the colonizers. I believe that

our problems with diabetes go back to those times. (Sharon, 63 years old)

Colonisation and history are overarching determinants of diabetes for this particular AI nation. This AI nation experienced and underwent trauma and drastic changes as a result of the reservation system that affected their health in several ways. First, confinement to the reservation took away their freedom and restricted their mobility. This, in turn, affected their ability to access food. Second, the government issued rations and many families were forced to accept them as a matter of survival, creating a dependency on the government in the process. As a consequence of confinement and the introduction of rations, traditional (and healthier) foods were replaced by a new diet that included tortillas and fried bread as staples. In addition, trauma was experienced as a result of militarisation, abusive school experiences, and losses associated with colonisation.

The results presented in this paper fell under the history section from a larger study. Participants were asked, “what do you think has caused so many people on the reservation to develop diabetes today?” For many participants ($n = 18$, 64%), diabetes could be traced back to historical and colonising experiences, including contact with Conquistadors and U.S. soldiers. Findings from this study are presented under the broad category of colonisation, whose sub-themes include the reservation system ($n = 9$, 32%), rations and diet change ($n = 15$, 54%), dependence ($n = 5$, 18%), and historical trauma ($n=4$, 14%).

Reservation System

As part of the colonising process, the U.S. established the reservation system as official federal Indian policy. Like many other tribal nations, this American Indian nation was confined to a reservation that covered only a small portion of their original land area. The reservation created boundaries that restricted movement, limiting hunting, gathering, and agriculture. Dale, a 44-year-old administrator for the tribe, stated,

When the reservation came, there was rule of law on paper—just that alone, I think, caused a change in the normal life. You can't run around.

You can't go raiding or you can't go do this or that without having some kind of permission or you might be violating some rule. The reservation is a land with—or a nation within a nation. You started to have an invisible line in which you needed to be in there, remain in there. The reservation life affected diabetes, I would say, it was just not being free and mobile like you once were in the past.

The rules implemented during early reservation times limited subsistence practices including hunting, gathering, and gardening that were essential for survival.

The reservation system also affected the self-sufficiency of the people. Timothy, a 48-year-old unemployed community member, recalled his parents telling him about how things had changed:

I've heard stories from our old days where my mom used to tell us, my used to tell stories about how it was way back when they were young, how they grew up, what they had to deal with. They said changes had already hit this place, because of how we were put on a reservation, when the reservation was implemented ... our self-sufficiency was already severed then. We could no longer do what we wanted. We were dictated to [as to] what we should do and how we should live. From that time our traditional way of eating food and our means of hunting for food changed.

According to Timothy, the reservation system affected their self-sufficiency by changing what they ate and how they acquired food, ultimately replacing a traditional diet with foreign foods.

In addition, the reservation system affected physical activity. “Everything that our ancestors did required some type of physical activity” and “we were people that moved around” were examples of typical responses. Physical activity was a normal part of everyday life and was explicitly taught and encouraged. As Brian, a 45-year-old tribal leader with diabetes, stated,

You could say that in a pre-reservation day being a nomadic people, health-wise, everybody was ... just physical ... [it was] part of everyday life and part of teaching as a young one. Young kids were awakened early in the morning, told go run down to the river and jump in the river and, after you wash yourself, run back home. After that, [the children would] help the leader in the fields when there was still farming, or help their parents in any

of the labor work that they did, but as the reservation days started we became accustomed to reservation life.

Food Rations, Change of Diet, and Dependence

Historically, this American Indian nation was semi-agricultural and semi-nomadic, moving from their summer and winter homes. They gathered food, grew crops (such as corn, sunflowers, beans, and squash), and hunted deer and elk. Before their reservation was established, 60% to 80% of families farmed and up to 65% of their diet was plant-based (Buskirk, 1986; Goodwin, 1942; Opler, 2002). However, food practices changed with food rations that were introduced at the inception of reservation life and the establishment of a fort on the reservation. As Melanie, a 60-year old elder with diabetes, recalled, “my grandfathers were scouts here. Back then the people came out to sell feed [to the soldiers] for the livestock, and then they would get rations, flour and lard, coffee. Just staple items like that ... salt.” Similarly, Josephine, a 47-year-old unemployed community member with diabetes, stated, “our chiefs were taken into custody or into camps. That’s when everything changed when they were forced to go into camps. We had to get rations ... that’s changed everything.”

The distribution of rations changed subsistence patterns. Ruth, a 41-year old unemployed mother with diabetes, stated, “the government introduced rations to our people. Before, we were nomadic and we were hunter[s]/gatherers. We lived off the land. Then they put us on reservations and started giving us rations, which was flour and shortening.” Additionally, Sharon, a 64-year-old elder and language advocate with diabetes, stated,

It [diabetes] is because of what became available to native people. Before that, we had different diets that were used by our ancestors [that] were the diets that we had [that] were from the natural resources that were available on our lands. After the military were here—in our lands here—they brought in foods that were not something that we were used to here. Previous to that, when the [they] were here on their own on their own lands, we had various, all types of edible plants and wildlife and other things that we gathered for our survival. Those [pre-reservation foods] were what

our bodies were used to physically consuming. Then, when the military came in our area here, they [the government] brought in goods that were for the military. Our people became used to those types of foods. We got used to flour and things like lard and people began to make their own goods from what [was] distributed. That’s how our families got hold of those items. Then, we learned to make bread, tortillas, and fried bread from those things.

Rations not only changed subsistence patterns and food practices, but it also started a cycle of dependence for food on the government. For example, Catherine, a 43-year old community member and cultural advocate, stated, “we became dependent on rations. It changed how we prepared food and how we gathered.” Similarly, Brian, a 45-year old tribal leader, stated,

Healthwise, our lifestyle changed. They [our ancestors] became dependent on the government for the rations, which were something different than that they were used to, something that they would just have to take and use in order just to feed their family.

The establishment of the reservation with its accompanying rules created dependence on rations that many families were forced to take as a means of survival. Ruth echoed similar sentiments:

That’s [rations] a big part of it [diabetes today] ... We weren’t going out and gathering berries and trying to eat right and eating meat and whatever the diet was at the time, but instead living off of what they’ve [the government] given us. It seems like through that system they’ve made us dependent on them.

Ruth believed that the introduction of rations contributed to diabetes and caused people to give up traditional food access practices that ultimately resulted in dependence.

Historical Trauma

The Historical trauma is the “cumulative emotional and psychological wounding, over the lifespan and across generations, emanating from massive group trauma experiences” (Brave Heart, 2003, p. 7) and “the impact of one generation’s trauma on subsequent generations” (Brave Heart & DeBruyn, 1998, p. 61). Several participants explicitly brought up the term historical trauma; however, many others brought up experiences

that were coded as such. For example, Sharon spoke about historical trauma in this way:

I believe our people have been affected. When you're affected psychologically, and when genocide has happened to your people and the warfare that went on with [omitted] people here, of course, there's gonna [sic] be symptoms that ... such as PTSD [post-traumatic stress disorder] ... this historical trauma is handed down intergenerationally from our ancestors ... even though our contemporary [omitted] might not be aware of that. They will deny it ... but they're not aware that our parents, our grandparents, suffered from [it] and ... how the mistreatment has brought these things down to us ... Genocidal policies by the U.S. government and by the Conquistadors strongly affect our health now.

The ancestors of this AI nation encountered the Spanish and later U.S. soldiers who built a fort on their lands. People brought up the fort and associated it with soldiers and with trauma. Mike stated, "way back in the 1870s, [the fort] was established... The reason they brought the soldiers in is to police [us]."

Catherine stated,

Fort [omitted] was created so that they [the soldiers] could keep watch on us, control us. That's how we became dependent on them. It [diabetes] was all related to [soldiers] taking what was ours for their benefit ... our cultural values ... the way we eat ... our traditions and our language and everything else.

Later on, the fort became a boarding school. Sharon stated,

My mom went to [omitted] School and talked about life in a boarding school and how they were told not to speak their language, and they couldn't do certain specific things, ceremonies ... We have lost touch with who we are. It's [the boarding school] taken things that are so precious to us, that we've always known in our way of life, our history [and] what was taught to us by our ancestors.

Melanie, a 65-year-old elder, talked about how people felt about the fort/boarding school:

Some people have real bad memories of [the fort], like being discouraged not to speak their language and being overworked. To this day some are like that. They don't want to come here

[fort/boarding school]. We know that some people are still hurt by the way they were treated.

The fort is a reminder of the past and a place from which changes stemmed from. People from this AI nation continue to live where they were colonised; they cannot move. Whitbeck et al. (2004) stated "the 'holocaust' is not over for many American Indian people. It continues to affect their perceptions on a daily basis and impinges on their psychological and physical health. There has been no 'safe place' to begin again" (p. 128).

Discussion

Colonisation and history are social determinants of health for this AI nation. It had profound and destructive effects on their health and society as a whole. Because this group was considered a threat, a fort was built on their lands to prevent contact with white settlers. They were forced to live near the fort and then later forced to stay within the reservation boundaries (Spicer, 1982). Prior to contact with U.S. soldiers and the establishment of the reservation, people lived in small semi-nomadic family groups and practised raiding, hunting, gathering, and agriculture for subsistence (Goodwin, 1969; Goodwin & Basso, 1971).

Because of confinement to the fort and later the reservation, subsistence practices were disrupted. They became confined people in a manner that robbed their freedom and restricted their mobility affecting their ability to access food; they were no longer able to hunt or gather the materials on which they depended for survival. People gathered what they could, but what was available became exhausted, and they could no longer feed themselves. The army responded by distributing rations. People were forced to accept them as a matter of survival, creating dependence in the process (Goodwin, 1969). They also became more sedentary as a result of restricted movement. These events created changes in how people interacted with the land, what they ate, how they prepared food, their activity levels, and it created a dependency on the Federal Government for survival, the effects of which all remain today.

The diet of this AI nation differs drastically from the pre-reservation times as a result of

colonisation. The distribution of rations introduced new foods such as flour, lard, sugar, canned meats, potatoes, coffee, and tea (Taylor et al., 2004). Sharma et al. (2007) conducted a study that was tasked to describe food intake, identify foods for intervention, and to provide data to guide nutrition programs with several AI nations including the one featured in this paper. According to results from their 24-hour *food frequency* questionnaire, the top sources of energy (or calories) were potato chips, fried bread, soda, fried potato dishes, tortillas, and burritos. The top sources of sugar were soda, juices (e.g., orange, apple, etc.), refined sugar, and beer. Finally, the primary sources of fat were from potato chips, fried bread, fried potato dishes, eggs, hot dogs, and sausages. Results also indicated that fruit and vegetable intake was low (Sharma et al., 2007). The study by Sharma et al. (2007) illustrates the drastic change in diet from pre-reservation times.

Conclusion

Colonisation and history are fundamental determinants of diabetes for this AI community. As part of the colonising process, historical traumas were experienced by this AI nation. The traumas, in this case, include contact with U.S. soldiers; the building of the fort, that later became a boarding school; and the establishment of the reservation that disrupted the traditional life course including current food practices that were passed on from previous generations. These changes have continued through subsequent generations creating health and other disparities in the process. Considering colonisation and history through a social determinants of health lens provides a more holistic view and deeper understanding of current health, especially as it relates to diabetes and food practices for this AI nation.

Although this community cannot change their history, they can learn about and from it. The work of Paulo Freire (2018) underscores the idea of emancipatory education as a way for oppressed people to regain their humanity and reclaim their voice in society: “this pedagogy makes oppression and its causes objects of reflection by the oppressed, and from that reflection will come their necessary engagement

in the struggle for their liberation” (p.48). In other words, Freire (2018) argues for examining the individual and/or collective forms of oppression as starting points, and from there, individuals can move forward to combat and free themselves from oppression. Learning about their history could potentially help people understand conditions that could impact identity attitudes and actualisation, which, in turn, could impact health. More specifically, many people expressed a desire that the native language and history be taught in schools. Although this option of teaching language and history in the school does not specifically address issues such as diet or physical activity, it may indirectly affect health through increasing cultural buffers and Indigenous knowledge.

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