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**Type 2 Diabetes Mellitus in Native Americans in US: A Brief Analysis on the Determinants**

**Introduction**

Previously referred to as adult-onset diabetes, type 2 diabetes (T2D) is a type of diabetes mellitus marked by elevated blood sugar, insulin resistance, and a relative deficiency of insulin.1 It is a significant public health issue worldwide. One in ten adults (20–79 years old)., or 537 million, have diabetes. By 2030 and 2045, this number is expected to increase to 643 million and 783 million, respectively.2 American Indians and Alaska Natives (14.5%) had the highest prevalence of diagnosed diabetes among both men and women, according to the 2018–2019 National Health Interview Survey.3 The previous paper revealed various determinants for T2D in Native Americans including obesity, genetic susceptibility, food habits etc. The goal of this paper is to analyse the determinants based on Socio-Ecological Model at each level contributing to the Native American population.

**Determinants based on Socio-Ecological Model (SEM)**

SEM provides insights and complex interactions of various determinants at individual, interpersonal, community and societal level for a public health problem. 4

At the individual level, obesity and adherence to medications among other factors are associated with T2D especially in the Native American population. Obesity, especially childhood obesity, is assessed using BMI-for-age percentiles. A child is considered "overweight" if their BMI-for-age percentile is greater than 85% but less than 95%.5 Long-term studies reveal that children who are overweight, whether assessed by raw weight, Body Mass Index (BMI), or weight relative to height, or who gain weight quickly, are at a higher risk of getting diabetes in their later years.6 Research has found that American Indian children have a higher prevalence of obesity and related health issues, such as type 2 diabetes, than other children in the United States.7

Another interesting individual determinant significant in Native American population is medication adherence. Adhering to drugs that lower glucose levels can improve blood sugar regulation and lower mortality risk.8 According to a study, compared to their non-Hispanic White counterparts, AI patients receiving care in non-IHS/tribal healthcare settings adhered to their diabetic medication far less frequently, which can lead to increased glucose levels in this population and later, other morbidities.9,10

Among interpersonal determinants, Adverse Childhood Experiences(ACEs) encapsulate a range of interpersonal determinants such as emotional, physical, and sexual abuse; emotional and physical neglect; exposure to intimate partner violence; living with a family member battling substance abuse or mental health issues; parental separation or divorce; and incarceration of a household member—all frequently occur, often together, and have a lasting impact on both mental and physical health well into adulthood.11 A wide range of ACEs are prevalent in the American Indian population, causing mental health to behavioural health problems in this population.12 ACEs lead to increase in blood glucose levels leading to T2D incidences later in life in Native Americans. 13

Social Support is another determinant among interpersonal determinants. Support from the family and the community was found to be essential for enhancing health and lowering obstacles to healthy behaviour. Healthy relationships resulting from family members providing emotional, practical, and positive support can improve diabetes control. 14 Triglycerides, cholesterol, and blood glucose levels were all lower in people from American Indians who reported their families supported them in eating a healthy diet.14,15

Access to healthcare facilities is a community or institutional level determinant. In general, Native Americans do not receive healthcare services on par with other Americans, according to a large body of literature. There are differences in certain resources, like infrastructure and staff availability in rural areas of Native American population.16 Inaccessibility affects diabetes management in this population.17

Another community level determinant is Food Insecurity. For many generations, Native American tribe have treasured their ties to the land, using their knowledge anchored in specific regions to hunt, fish, gather, and raise food, all of which are essential components of a healthful diet. Nonetheless, the process of colonization drastically impacted these long-standing dietary traditions and eating habits. These abrupt and profound changes to landscapes and traditional ways of life jeopardized the ecological integrity of food systems as well as the food security of Native American people.18

Now, experiencing food stress negatively affects diabetes empowerment and diabetes distress, as also seen in the Native American population.19

Society level determinants include health disparities and Racial inequities. Obesity, diabetes, and hypertension are well-known health disparities among Native communities, with contributing socioeconomic variables such as poverty, low educational attainment, and a lack of insurance. There is a scarcity of high-quality population health data and established assessment tools, making it difficult to effectively implement and evaluate community-level and multilevel treatments. 20

Racial discrimination against Native Americans presents itself in a variety of elements of daily life, with more than 23% reporting prejudice in healthcare settings, which not only discourages individuals from getting necessary medical care but also contributes to a greater systemic inequity in health outcomes. This ubiquitous discrimination, observed in both clinical visits and interactions with law enforcement, highlights a loop of anticipated bias and institutional barriers that exacerbates health inequalities in Native communities. 21

**Conclusion**

This analysis highlighted various drivers of type 2 diabetes among Native Americans using the Socio-Ecological Model. The prevalence of type 2 diabetes among American Indians and Alaska Natives emphasizes the crucial need for a multidisciplinary strategy to addressing this public health issue. Diabetes prevalence and management are influenced by individual factors such as obesity and medication adherence, interpersonal elements such as childhood trauma and familial support, community issues such as healthcare access and food security, and societal challenges such as racial inequity and health disparities. In the next analysis, I will present interventions to address T2D in Native Americans.

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