Exploring the Role of Dietary Acculturation on Prediabetes and Type 2 Diabetes Rates in Asian Indian Immigrants in the United States

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As Asian Indian immigrants make up a significant community in the United States, it is important to explore how the unique diet and food behaviors in the community are contributing to the high rates of prediabetes and type 2 diabetes (T2DM). The paper explores some key social and cultural factors affecting Asian Indian immigrant food culture and theorizes the impact of these factors on their health and well-being. Building on the Dietary Acculturation Paradox and Festival Food Theory, the paper examines how misconceptions about the American diet, combined with changes in eating habits, can lead to negative food behaviors among Asian Indian immigrants that increase the risk for diabetes. The theoretical framework seeks to highlight the need for culturally tailored public health interventions among Asian Indians and immigrants to tackle the growing rates of prediabetes and T2DM. Building on these connections, the paper recommends community-centered research to better understand the impact of dietary acculturation on immigrant health and develop long-term solutions to improve dietary health of immigrants in American food culture.

Keywords

Diabetes • Asian Indians • Immigrants • Dietary Acculturation

Introduction

Prediabetes and type 2 diabetes mellitus (T2DM) are alarming chronic conditions where the body can't regulate blood glucose levels, developing into severe outcomes like blindness, kidney failure, and stroke (Alvarez et al., 2023; Goyal et al., 2023). According to the CDC, 37.3 million people in the United States alone have diabetes (Centers for Disease Control and Prevention [CDC],

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2020). These issues are particularly concerning among minority groups like Asian Indians. In a study analyzing data from National Health Interview Survey 1997–2008, Asian Indians also have one of the highest prevalence of prediabetes (33%) and type 2 diabetes (17%) when compared to other Asian Americans and Whites in America (Lee et al., 2011). In diagnosed diabetes prevalence reports of 2017–2018, Asian Indians had a higher percentage (12.6%) of prevalence compared to White, non-Hispanic (7.5%) and Asian group as a whole (9.2%) (CDC, 2020). Asian Indians were also 70% more likely to be diagnosed with diabetes compared to non-Hispanic whites (CDC, 2020). Due to "Model Minority" notions that Asians are more successful than other minorities, and monolithic research that groups all Asian subgroups into one category, the Asian Indian diabetes problem has been often overlooked in research and public health. According to Census reports, the Asian Indian community has increased 54.7% between 2010 to 2020, making the most populous Asian alone group at 4.39 million (Rico et al., 2023). As of 2022, 66% of Asian Indians living in the U.S. are immigrants, while 34% are U.S. born (Pew Research Center, 2024). The unique identity of Asian Indians as immigrants, alongside lack of systemic focus on the health challenges in the community presents them as a particularly vulnerable population to consider in public health.

Asian Indians, and many South Asians, are genetically at a higher risk for diabetes and prediabetes, which can be exacerbated by lifestyle factors including smoking, alcohol use, diet, and physical inactivity (Shah & Kanaya, 2014). There are other individual risk factors including family history and comorbidities such as obesity, hypertension, and depression (Wu et al., 2014). However, even after adjusting for these factors, Asian Indian immigrants had an increased risk of diabetes compared to other ethnic groups (Kanaya et al., 2010). There are many challenges of immigration to the US, but one often overlooked is changing food behaviors that can impact the quality of one's diet. One of the biggest recommendations for preventing and managing prediabetes and T2DM is following a healthy diet to help control insulin resistance and blood glucose levels (Alvarez et al., 2023). While high intake of red meat, sugar, and fried foods can contribute to the increased risk of T2DM, higher intake of fruits and vegetables can act as protective factors against the development of T2DM (Sami et al., 2017). Therefore, it is important to consider diet quality, especially in the context of changing food behaviors as part of immigration to the U.S. In a systematic review on Indian dietary patterns, researchers discovered dietary patterns in India are predominantly vegetarian with vegetables, cereals, and fruits being the most frequently consumed food groups, followed by meat, pulses, and dairy, while snacks and sweets were less common (Green et al., 2016). It is also important to highlight that there are significant regional and demographic differences in diet, with South and East India consuming higher amounts of meat, fish, and snacks, while North and West India consume more lentils, pulses, and vegetables (Green et al., 2016). On the other hand, the Standard American Diet (SAD) or the Western Diet (WD) is noted for excess consumption of refined carbohydrates, added sugar and sodium, meats, fats, while lacking standard intake for whole grains, fruits, and vegetables (Grotto & Zied, 2010). SAD is also more likely to include high-calorie and nutrient-poor meal and snacking options, alongside higher rates of sugar-sweetened beverages and alcohol (Grotto & Zied, 2010). Understanding the very wide differences in the food culture and associated behaviors across India and the United States, it is important to explore the impact of Asian Indian immigrants transitioning into new American food cultures, and resulting changes in diet and food behaviors, especially since SAD diet qualities have been repeatedly linked to negative health implications for Americans, including chronic conditions like prediabetes and T2DM (Grotto & Zied, 2010). However, there is little all-inclusive research on how Asian Indian food behaviors in the American food culture can progress or exacerbate prediabetes and T2DM in the

U.S. Therefore, this article seeks to explore possible relationships between food and developing diabetes especially among Asian Indian immigrants.

Dietary Acculturation Theoretical Framework

Immigrants go through the process of acculturation- "the process of adopting or adapting to a different culture, especially that of a colonizing, conquering, or majority group" (Oxford English Dictionary, 2021) during their transition to a new country. One such specific change is dietary acculturation, where immigrants adopt eating patterns and practices of their new environment. However, adapting diet and eating behaviors can create conflict between traditional habits and new food culture, impacting overall health.

Over the years, there have been consistent findings in the Mexican immigrant population concerning changed eating patterns due to the SAD (Ramírez et al., 2017). Native Mexicans tend to consume lower total energy intake compared to US-born Mexican-Americans and Mexico-born Mexican-Americans (Batis et al., 2022). While immigrant Mexican populations increased intake of low-fat meat, fish, and high-fiber bread, they also increased intake of saturated fats, sugar, dessert and salty snacks, pizza, and French fries in the U.S, resulting in a net negative impact of dietary acculturation (Batis et al., 2022). Furthermore, as the level of exposure to the US environment increased, the Mexican-American diet shifted toward an unhealthier one (Batis et al., 2022). These results are consistent with a phenomenon known as the Dietary Acculturation Paradox, where immigrants increase sugar, fat, and processed food intake and decrease fresh fruits and vegetable consumption as they adjust to American culture.

Further exploring this, Ramírez et al. (2022) points out how much the degree of transformation, even assimilation, to American culture correlates to the quality of diet. Using large-scale data on Mexican Americans from the National Health and Nutrition Examination Survey, Ramírez et al. found that immigrants who completely assimilated to American culture had the worst diets, but immigrants with low assimilation rates and cultural retention had better diet quality (2022). Looking into Hispanic/Latino immigrants, researchers also find a common immigrant community belief that traditional eating patterns and food are unhealthy, while the American diet is more health-conscious and suitable for long-term health improvement (Ramírez et al., 2017). These misconceptions can lead to giving up on health-protective habits such as consuming fruits and vegetables that are associated with traditional eating habits, and instead incorporating more processed foods that are common with SAD (Ramírez et al., 2017). Combining these findings, the dietary acculturation theory conveys food behaviors change in new cultures of America, and the Dietary Acculturation Paradox suggests that the modifications can cause worse health behaviors and outcomes. However, even new immigrant groups don't meet the requirements for a healthy diet. Even Mexicans with the least acculturation and best diet in the community had a worse diet quality than the general American population as measured by the Healthy Eating Index (HEI)-2010 that measures adherence to dietary guidelines (Ramírez et al., 2022).

The Festival Food Theory in minority communities can explain in part this trend. As described in the *Festival Foods in the Immigrant Diet* research by Azar et al. (2012), minority immigrants draw comfort of culture and home from their food. Food, especially in positive interactions, like festivals, becomes culturally and emotionally necessary for immigrants' well-being in a new country. However, these festival foods are often high in sugars and fats, and designed for occasional consumption.

In native countries, they were also costlier and unavailable at all times of the year. Yet the increased purchasing power in America, easy frozen availability in stores, and the emotional value make it common to the daily diet of immigrants (Azar et al., 2012). As explained by the authors, the immigrant "diets may still be ethnic, but they are not the traditional diet" (Azar et al., 2012). The new 'traditional' diet often misconstrues the ancestral wisdom of traditional food culture and protective food measures set in place. When paired with the dietary acculturation paradox, these theories suggest an immigrant even without assimilation goes through a negative diet transformation in the American food culture.

Current Dietary Acculturation Patterns among Asian Indian Immigrants and Impact on Diabetes and Prediabetes

Most Asian Indians in the U.S. have moved within the last decade and are currently facing the dietary acculturation process (Hannah & Batalova, 2020). Asian Indians go through similar changes in food behaviors as Mexican Americans. Venkatesh and Weatherspoon used questionnaires and focus group findings to measure dietary behavior and changes upon immigration from 30 Asian Indian participants (2018). Asian Indians adapted to the SAD and incorporated 'more soda, burgers, chocolates, ice cream' as part of their acculturation to the American Food culture (Venkatesh & Weatherspoon, 2018). They also believed American food culture was more health conscious, which can be attributed in part to more health awareness in the U.S. for portion control and salt selection in salads and vegetables (Venkatesh & Weatherspoon, 2018). However, participants also noted feeling restricted due to calorie-dense and carbohydrate-rich cheap food and expensive produce. These findings are similar to other reports of Americans, especially ethnic and minority participants, understanding of the importance of fresh fruits and vegetables in their diet but being unable to adhere to these recommendations due to high costs, perceived lack of time, and limited access to good quality produce (Yeh et al., 2008). These also raise high food insecurity concerns in the U.S. food culture for immigrants that contribute to worsening diet quality in the U.S. compared to native countries (Sharareh et al., 2023). Asian Indians also admitted to replacing traditional foods or consuming the most widely available ethnic food since preparing alternatives or looking for fresh options was time-consuming and required travel (Venkatesh & Weatherspoon, 2018). As explored in the Food Festival Theory, Indians in America relaxed many religious and cultural rules on consuming meat, alcohol, and types of food (Azar et al., 2012; Venkatesh & Weatherspoon, 2018). The new food independence in America of Asian Indians explained in part their changes with food decisions and incorporation of more added-fats and caloric options in the U.S. (Azar et al., 2012). However, these changes increase the risk for prediabetes and T2DM.

As theorized, adjusting to the American food culture can decrease the diet quality of Asian Indians. Unfortunately, these new food behaviors correlate with a greater risk of developing prediabetes and type 2 diabetes (Sami et al., 2017). The developed negative food behaviors and diet in Asian Indians are known determinants of cardiometabolic diseases. The review on the *Effect of diet on type 2 diabetes mellitus* describes recent evidence that "high intake of red meat, sweets, and fried foods, contribute to the increased risk of insulin resistance and T2DM" (Sami et al., 2017). As Asian Indian food behaviors and Festival Food Theory demonstrate, immigrant diets rapidly incorporate such foods when transitioning into American food culture. American diet additions to the native diet are also proving problematic. Recent research shows that soda's high fructose corn syrup

presence raises blood glucose levels, and glycated chemicals build insulin resistance (Sami et al., 2017). Also, there is a decrease in vegetables and fruits, proven protective barriers against T2DM, in Asian Indians (Sami et al., 2017).

A common misconception remains that since Asian Indians have high rates of cardiometabolic diseases, immigrants must have already developed these conditions before their immigration. However, data finds that "newly arrived immigrants tend to have lower rates of obesity and diabetes than the general population, but these rates increase rapidly with duration in the US (Azar et al., 2012)." Another common misconception remains that Asian Indians' may have reduced risk for developing these cardiometabolic conditions than native Indians. The *Mediators of Atherosclerosis in South Asians Living in America (MASALA) study* and the *Center for Cardiometabolic Risk Reduction in South Asia (CARRS)* studies used mass community questionnaires and medical-based standards for participants to compare type 2 diabetes and prediabetes prevalence in Asian Indian immigrants and Native Indians in India (Gujral et al., 2015). Their results suggest that while native Indians are more likely to have type 2 diabetes, Asian Indian immigrants have a much higher prevalence of prediabetes (Gujral et al., 2015). The findings suggest that Asian Indian immigrants are developing chronic diet-related health conditions at a comparable rate to native Indians, but potentially being detected among the immigrants before progressing into type 2 diabetes as health screenings are more common in the U.S. (Gujral et al., 2015). Therefore, the role of diet in prediabetes and diabetes development among Asian Indian immigrants should be analyzed separately from other risk factors.

With the background knowledge of the diabetes epidemic in the community, the food behaviors of American Asian Indians are noteworthy in the risk of developing prediabetes and type 2 diabetes. Pairing the American diet influence with the absence of healthy ethnic Indian foods may leave Asian Indian immigrants with little to no dietary support in preventing prediabetes and type 2 diabetes.

Discussion and Future Implications

The concern of Asian Indian immigrants leading an unhealthy diet life that can develop into severe chronic conditions is truly a public health and societal problem. The study was meant to devise a framework to qualify changes in food behavior, and dietary acculturation, as net positive or negative. The research focused on measuring the impact of these changes on dominant diet-caused illnesses in the community: prediabetes and type 2 diabetes. While it is common to view the role of nutrition in developing prediabetes and type 2 diabetes in the context of experimental science-based research, this paper explores it within social-cultural factors. The paper attributes the prevalence of prediabetes and type 2 diabetes to many social structural troubles like the absence of proper cultural education and healthy ethnic foods in markets.

Registered Dietitian (RD) Wendy Lopez often gets "clients who feel defeated because they think they have to give up tortillas and plantains in the name of good health" (Byrne, 2018). For years, the lack of proper and culturally relevant nutrition education to address these concerns has fostered harmful diet beliefs in immigrants. These issues also extend to other Western countries. Sobia Khan RD, illustrates, "Health Canada's current food guide doesn't include many diverse ethnic foods in its examples of healthy eating patterns despite having a multicultural population (Byrne, 2018)." Dietary acculturation and festival food theories illustrate how cultural trends become a large-scale

community behavioral crisis. It is necessary to investigate a relationship between the American food culture, from lack of cultural resources and imbalanced availability of healthy ethnic food to diet illnesses in the Asian Indian population.

The paper seeks to build on multiple theories to explore sociocultural factors and explain the growing rates of chronic health conditions in a unique immigrant group. When survey support for dietary acculturation fails to explain why immigrants who prefer traditional food still develop prediabetes, integrating social-cultural values placed on unhealthy ethnic food addresses the concern. Therefore, this methodology builds a framework using empirical science, quantitative data, and other theoretical support for recommending changes in nutrition education. The paper aims to add to the growing literature and conversation regarding nutrition and food culture of the U.S., and its impact on a particularly vulnerable and growing group of Asian Indian immigrants' health.

It is also necessary to consider the constraints of the methodology. The dietary acculturation process isn't a completely negative influence, rather behaviors learned like portion control and salt control in the U.S. and increased health awareness are important for Asian Indian immigrants (Venkatesh & Weatherspoon, 2018). However, in the context of cardiometabolic disease, the process mostly indicated damaging behaviors for both immigrant groups. It is crucial to understand that often contradictory data exist when isolating one lifestyle factor and a disease occurrence. The paper is limited to a connection between one variable of dietary acculturation and its impact on diabetes. It doesn't define a sole causative relationship. The work therefore only brings forth an issue that can center extensive community-based research in the future.

The framework depicts how such social problems can contribute to medical conditions. The work also confines that the complete process of dietary acculturation isn't harmful, but primarily the learned behaviors and eating patterns are concerning. Understanding these passed-on factors of American food culture, and how they can impact immigrant health can help tailor more effective public health interventions to target diabetes and prediabetes in the community. Beyond Asian Indians, other immigrants are also recently facing high rates of obesity and cardiovascular diseases. Therefore, the process of dietary acculturation needs to be further explored not only for the Asian Indian community but also for other immigrant groups and concerning the overall food culture in America. Exploring these challenges can contribute to improving food culture and help reduce the prevalence of diet-related health conditions in the U.S.

Conclusion

Asian Indian immigrants in the U.S. are undergoing significant changes in their diet and food behaviors that may exacerbate the risk for prediabetes and type 2 diabetes. Therefore, it is necessary to investigate a relationship between the American food culture, from lack of cultural resources and imbalanced availability of healthy ethnic food, and diet illnesses in the Asian Indian population. Many Asian Indians and immigrants misconstrue health benefits of the American diet, leaving them more vulnerable to developing cardiometabolic conditions. Since immigrants remain an underserved and under-researched community, a public health challenge lies ahead in tackling the growing rates of prediabetes and type 2 diabetes among these populations. While the process of dietary acculturation can shed some light on food behaviors, it also highlights an important need for culturally relevant and community-tailored resources for Asian Indians and immigrants in the U.S.

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