How Mexican Food Traditions, Beliefs, and Accessibility Influence Nutrition Care and Health Outcomes

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I. Introduction

I chose to write about Mexican culture, with an emphasis on how to better understand and provide support and nutrition care to Mexican Americans. It is important for Registered Dietitian Nutritionists (RDNs) to understand how Mexican food traditions, beliefs, and accessibility influence nutrition care and health outcomes as we may provide nutrition care, counseling and education to Mexicans and Mexican Americans. According to the United States Census Bureau, approximately 35.9 million Mexicans lived in the United States in 2020.[1] Additionally, the Mexican population grew by 4.1 million from 2010 to 2020.[1] Mexican Americans make up 62% of the Hispanic population in the United States and primarily reside in the states of Arizona, California, and Texas.[2]

II. Religious or Cultural Influences

The 2020 Mexican government census revealed that roughly 78% of the Mexican population identifies as Roman Catholic, 10% identifies as Protestant or evangelical Protestant and 1.5% identify as "other" religious groups.[3] Interestingly, roughly 55% of Mexican Americans identify as Roman Catholic, 22% identify as Protestant and 18% identify as "other" religious groups.[2] Regardless, Roman Catholicism is the predominant religion in Mexico and amongst Mexican Americans in the United States.

Traditional Roman Catholic religious ceremonies are very important for Mexican families in both the US and Mexico. These religious ceremonies include baptism, communion, confirmation, lent, and the novenas (nine days of prayer for the deceased).[2] Large family gatherings to celebrate important religious milestones occur when a Catholic sacrament is

received by a member of the family (both immediate and extended family). These sacraments include baptism, first holy communion, confirmation, and matrimony.

During sacramental celebrations, Mexican and Mexican American families celebrate by preparing large amounts of foods. These traditional celebratory foods may consist of fresh pig (usually shot in the head by the Patriarch of the family right before being cooked underground), beans, rice, tortilla, pig blood pudding, a variety of sweetened desserts, cerveza (beer), and sweetened beverages for the children. There is no shortage of food when it comes to these celebrations, and many may overeat during this time. Lastly, adults tend to get quite intoxicated during these celebrations.

In contrast, many Mexicans and Mexican Americans will fast during mandatory fasting and abstinence days that are preset by the Catholic Church. These fasting and abstinence days occur during Ash Wednesday, every Friday during Lent, and Good Friday (the Friday before Easter). Fasting in the Catholic Church does not involve a complete fast (i.e. abstaining from all food). Fasting consists of abstaining from meat and eating only one small complete meal and two smaller meals throughout the day. It is important to note that the two smaller meals should not add up to one complete meal. Fish is allowed during these fasting periods, and many Catholic Churches will have a traditional “fish fry” each Friday during lent where Catholic parishioners gather to eat with one another. Children under 14 and adults 59 and older are exempt from Catholic fasting periods. It’s important to note that lesser observed fasting and abstinence days in the Catholic Church also occur during Ember Days and St. Michael’s lent. However, most modern-day Catholics (including Mexican and Mexican American Catholics) do not traditionally observe Ember Days or St. Michael’s lent. Mexicans and Mexican Americans are very active in their respective Catholic Churches.

Traditionally, family is the most important aspect in Mexican culture. Mexican society is patriarchal in nature and hold many patriarchal beliefs (known as *machismo*).[4] *Machismo* is most associated with Mexican and Mexican Americans than any other Hispanic culture.[4] The father, or oldest male relative, is traditionally the head of the household, the main decision maker and is responsible for providing for the family.[2] Women traditionally stay home to take care of the household, cook, take care of the children, and take care of all household chores. Men are the head of the family and women are the foundation of the family. However, the female labor force participation is slowly changing as women in Mexico now represent 45.8% of the workforce and men represent 77.4%.[5,6] In the United States, 50% of Mexican American women work outside of the home yet are still responsible for household chores and caregiving roles.[2]

Additionally, because Mexico is traditionally a patriarchal society, Mexican and Mexican American male children tend to receive special attention, treatment and are the preferred gender. However, siblings, regardless of gender, are taught to work together and sibling rivalry is usually not accepted nor tolerated.[2] Families in Mexico tend to live in the same city or village. Mexican Americans also prefer to live close to extended family, as family unity is of utmost importance to both Mexican and Mexican American families. The family traditionally eats together during meals, and it is expected that the women of the household and female children prepare all meals. Additionally, women and female children are responsible for cleaning up after meals are consumed.

Lower socioeconomic Mexicans and Mexican Americans may breastfeed their children until the child reaches school age (~5 years old). Lower socioeconomic families may choose to breastfeed their children until ~5 years old as it is believed in Mexican culture that breastmilk is the best nutrition a young child can receive on a limited budget. Additionally, breastfeeding

young children is also recognized as *one less mouth to feed*, hence helping the family unit as Mexican and Mexican American families tend to be quite large.

III. Traditional Food Practices

Mexicans and Mexican Americans are deeply connected to their culinary heritage and take great pride in their traditional ingredients and cooking techniques.[2] Traditional Mexican cuisine is a blend of Native and European foods that are often prepared with Aztec and Spanish cooking techniques.[2] Prior to the colonization of the Spanish, staple indigenous food items such as xocolatl (chocolate), corn, tomato, legumes, fruits, vegetables, turkey, dogs, deer, peccary, rabbits, and a variety of chili peppers were ingredients native to the Aztecs and were the foundation of many dishes throughout Mexico.[2] It is important to note that the *usual* dietary pattern consumed by the Aztecs prior to colonization was a vegetarian diet that mostly consisted of beans and corns.[2]

However, when the Spanish arrived in Mexico, they brought Asian cinnamon, anise, black pepper, sugarcane, rice, wheat, ginger and garlic.[2,7,8] The Spanish also brought meats such as chicken and hog.[2,7,9] Chicken and hog were not native to Mexico yet now make up staple meats in Mexican cuisine. Prior to the introduction of chicken, turkey was the preferred fowl used in indigenous recipes. The combination of Spanish and indigenous Aztec ingredients have become the staple many Mexican and Mexican Americans regularly eat today – pork or chicken corn tacos (corn tortillas filled with either pork or chicken), tamales (pork or chicken encased in masa flour and then steamed), salsa (combination of onion, tomato, cilantro, and chilies), and arroz (rice cooked with or without tomatoes) – just to name a few.[2]

Staple foods in Mexico consist of frijoles (beans), arroz (rice), a variety of chili peppers, corn, tomatoes, squash, cocoa, fresh fruits and vegetables, and meat such as pork, beef, and

chicken.[2] Additionally, most foods are cooked in either lard or butter, though lard is largely preferred.

Meals are commonly served family style with meat as the main dish (usually pork, chicken, or beef), and sides such as rice, beans, corn tortilla and jalapeño. Fresh fruits and vegetables may also be included as a side dish and may be cooked or served raw, depending on the region and seasonal availability. Whole meals are often cooked and served in a variety of ways. For example, *albondigas* is a savory stew in which ground beef meatballs, potato, onion, carrot and rice are cooked in a tomato broth and served warm with a fresh tortilla and a whole jalapeño (either raw or roasted).

Common meal patterns in Mexico and amongst Mexican Americans heavily rely on economic status. In families who have plenty of money, the normal dietary pattern consists of four to five meals a day, which are breakfast, a coffee break, lunch, a late afternoon snack, and dinner.[2] Lunch is the largest meal of the day and consists of several courses served individually.[2] However, it is important to note that Mexicans are now slowly adopting American meal patterns by consuming a lighter lunch and larger dinner.[2] Families with higher socioeconomic status tend to consume more fruits, vegetables, protein, and refined grains whereas families with lower socioeconomic status consume more beans, greens, fatty acids and saturated fats.[9] Meal patterns amongst Mexican Americans vary. Mexican Americans who have lived in America for decades still consume traditional Mexican foods but tend to adopt an American meal pattern (smaller breakfast, smaller lunch, larger dinner). However, many Mexican American immigrants who have not spent a significant amount of time in America, or who have chosen to live solely in their Mexican communities, may maintain their traditional meal patterns. However, socioeconomic status plays an important role in daily meal patterns.

As previously stated, Mexican and Mexican Americans are deeply connected with their culinary heritage and take great pride in cooking with staple ingredients and consuming common meal patterns. Mexican Americans tend to stick to their traditional food practices even after immigrating to the United States, and these traditional food practices are passed down from generation to generation.

IV. Food Accessibility & Modern Dietary Shifts

It's important to note that food preferences and availability largely vary by region. The North and Central regions of Mexico frequently consume beef.[2] Other meats consumed include goat and sheep. In Coastal areas of Mexico, local fresh fruits (mainly tropical fruits) and vegetables are consumed, with fish and other seafood sources such as shrimp, shark, and clams are usually the main protein source.[2] More inland areas of Mexico may consume freshwater fish from lakes.[2] However, non-coastal areas and areas of Mexico not near waterways rarely, if ever, consume fish and tend to focus more on beef, pork, chicken, turkey, and goat.[2] In tropical areas, which are located in the southern coastal areas of eastern Mexico, freshwater fish and seafood such as shrimp, octopus, crabs and clams are the predominant cuisine and are often served with rice cooked with garlic and tomato in addition to fresh tropical fruits and vegetables.[2]

Cuisine from the Yucatán peninsula is quite different from foods from other parts of Mexico as Yucatán was once isolated from the rest of the country due to its dense mountainous jungles.[2] A traditional preparation that is unique to the Yucatán peninsula consist of steaming foods wrapped in banana leaves.[2] Other traditional foods still consumed include salbutes (small fried corn tortillas) layered with fresh vegetables such as lettuce, cabbage, tomato, onion, bell pepper, and meat.[2] Many traditional dishes are also flavored with lime and other citrus fruits located in the Yucatán region.[2] Other unique meals include black beans with pork, fish, and

oysters.[2] Lastly, in Southern Mexico, the cuisine is tropical in nature and strongly influenced by indigenous flavors and cooking traditions.[2] Pork, goat and poultry are the most widely consumed meats in Southern Mexico. Additionally, tomatoes, sesame seeds, chilies, raisins, yams, plantains, avocado and avocado leaves, black beans, corn tortillas and beverages such as hot chocolate (cacao trees are cultivated in this region) are popular traditional foods consumed as well.[2]

The impacts of globalization, urbanization, and socioeconomic factors on traditional dietary patterns vary widely depending on socioeconomic status and the region of Mexico one resides. Remote regions and smaller villages that are disconnected from urban environments still maintain many of their traditional dietary patterns as they often eat what is available in their regional area. However, in more urbanized areas of Mexico, snacking is frequent and ultra-processed foods (UPFs) and sugar sweetened beverages (SSB) are widely available. Nearly every corner of urban areas have tiny stores known as *tiendas*, which contain chips, cakes, soda, and other ultra-processed foods. Tiendas usually have minimal fruits and vegetables available.

A nutrition transition in Mexico has occurred over the past 30-years in which traditional Mexican cuisine is being replaced with UPFs and convenience packaged foods/meals.[8] As a result of this 30-year nutrition transition, the prevalence of obesity in Mexico is amongst the highest in the world and there is a distinct uprise in noncommunicable diseases.[10] Mexicans are consuming higher amounts of sugar, fat, cholesterol, UPFs, and higher-caloric beverages and less of their traditional foods.[8]

V. Nutritional Benefits & Challenges

There are many nutritional challenges in Mexico today. Roughly 40% of Mexican children and adolescents are either overweight or obese.[10] Additionally, 75% of Mexican adults are either overweight or obese.[10] The prevalence of obesity amongst Mexican women is ~40%.[10] Despite high prevalence of obesity amongst the Mexican population, it is important to point out that an individual can still suffer from nutritional deficiencies and malnutrition while being overweight or obese. The double burden of malnutrition must not be overlooked in urban populations.

In more rural areas of Mexico, the local population may suffer from stunting, wasting, micronutrient deficiencies and malnutrition. Mexico faces many nutritional challenges as those in more rural areas may suffer from nutrient deficiencies yet those in urban environments may also suffer from nutrient deficiencies as a result of overnutrition (double burden of malnutrition). Therefore, the Mexican population is presented with a difficult situation – overnutrition (yet still suffering from nutrient deficiencies) and undernutrition in more rural and poorer areas, which result in significant nutrient deficiencies.

In the United States, 50.9% of Mexican American women and 49.5% of Mexican American men are obese.[11] There is little to no data on what percentage of the US Mexican American population suffers from the double burden of malnutrition.

It is important to mention that Mexico has implemented policy known as the *Mexican Toolkit for obesity prevention,* which emphasizes the promotion of sustainable behavior change amongst the Mexican population with the ultimate goal to prevent obesity and noncommunicable diseases in the future.[10]

Another nutrition transition in Mexico is currently underway as a result of the *Mexican Toolkit for obesity prevention* policy. This nutrition transition aims to promote increased consumption of vegetables, fruits, fiber, complex carbohydrates, and water while decreasing the consumption of sugar sweetened beverages, UPFs, and sedentary behavior.[8]

VI. Dietary Counseling Considerations

Since we are located in the United States, I am going to focus on the Mexican American population for this section. Strategies dietitians can use to provide culturally competent nutrition education to the Mexican American population is to first *understand what traditional foods and staple foods the Mexican American population consumes*. I cannot emphasize this enough as I have known people in my own family who will never see a dietitian again due to the lack of understanding of cultural foods.

A person very close to me saw a dietitian for one-on-one diabetes nutrition counseling and was not taught how to incorporate her cultural foods into her meals. Instead, she was told *not* to eat her cultural foods such as tortillas, rice, and beans. This occurred five years ago. I recently encouraged this person (who is suffering from uncontrollable blood sugar) to see a dietitian and she replied with, "I'm not going back. She told me I couldn't eat my cultural foods. She only told me to eat *white people food*." This is a real-world example of *why* dietitians must understand other cultures and ensure that important cultural foods and meal pattern are incorporated into nutrition counseling and education.

Though each individual Mexican American is different, and foods and meal patterns may vary widely based on households and the region of Mexico the Mexican American immigrated from, it is imperative that dietitians have a solid understanding of Mexican culinary heritage and the nuances of food patterns from each region.

Additionally, dietitians should understand what diseases most impact the Mexican American population to better understand what types of nutrition education material may benefit the population. For example, 33.4% of Mexican American women and 47.6% of Mexican American men suffer from hypertension and the leading cause of death for Hispanics of any race are heart disease, cancer, unintentional injuries, and stroke.[11,12]

Lastly, dietitians can conduct a *nutrition needs survey* or *focus group* amongst Mexican Americans in their local area to better learn what types of nutrition education the population feels they would best benefit from. Including the *voices* of those we want to provide nutrition education for is perhaps the most important aspect. Unless we are directly living in the population, and are part of the culture, we do not fully know or understand what the population needs. I am a Mexican American and I would still conduct a focus group or nutrition needs survey prior to conducting nutrition education to the Mexican American population.

VII. Lifecycle Nutrition Implications

Cultural food challenges, traditions, and limitations directly impact an individual across all lifecycle stages. Studies suggest that poor early childhood nutrition is associated with an increased risk of developing non-communicable diseases such as obesity, dyslipidemia, hypertension, diabetes, cardiovascular disease, cancer, chronic lung diseases, and neurological, mental and musculoskeletal disorders.[13]

To start with infancy, ~94.2% of Mexican mothers breastfeed their infants and ~23% continue to breastfeed after the 6-month mark.[8,14] Additionally, Mexican families may mix an infant's breastmilk (or formula) with sweetened liquids, water, or sweetened herbal teas, which increases the risk of tooth decay and iron-deficient anemia.[8,13]

Depending on socioeconomic status, infants in Mexico are usually breastfed between 12-18 months. However, infants who are born into lower socioeconomic households may continue to be breastfed into toddler and/or preschooler ages for economic reasons (i.e. “one less mouth to feed”). This is especially prevalent in rural areas of Mexico. Additionally, wet nurses are common in lower socioeconomic areas as the belief is that breastfeeding allows a family to feed their infant/toddler/preschooler in the “most healthy way” while also not creating an extra burden to food insecure families. However, it is important to mention that this belief amongst some lower socioeconomic Mexican families is not true and puts the child at significant risk for several nutritional deficiencies.

Data from the Mexican *National Health and Nutrition Surveys* from 2006 to 2020 suggests that amongst children under 5 years of age, 13.9% suffer from stunting, 4.4% are underweight, and 1.5% suffer from wasting.[15] In contrast, 8.4% of children under 5 years of age are overweight.[15] Regardless of if the child under 5 years of age suffers from stunting, underweight, wasting, or are overweight – all ailments are associated with dietary patterns.[16] Stunting has been identified as a main public health problem in Mexican children <5 years of age.[16]

Due to the increased availability and consumption of sugar-sweetened beverages (SBB) and UPFs, Mexican children and adolescents suffer from the double burden of malnutrition (DBM).[17] Studies suggest that the consumption of UPFs in children of lower socioeconomic status (SES) are positively associated with the DBM.[17] In contrast, the association between UPF consumption and DBM is positively associated with adolescents of higher SES.[17] It is important to mention that there is conflicting data as other studies have found that children and adolescents of lower SES suffer from higher rates of DBM.[17] Regardless, it is clear that the decreased

consumption of traditional foods has led to the DBM and obesity epidemic amongst Mexican children and adolescents.

Additionally, micronutrient deficiencies, stunting and anemia are prevalent amongst Mexican adolescents ages 12-19 years.[18] Studies suggest that Mexican adolescents who consume a Western dietary pattern (high intake of UPFs, SBB, salty snacks, saturated fat, sandwiches, fast-food, cereals/tubers, and charcuterie) are associated with malnutrition (overnutrition and undernutrition) and experience higher rates of DBM.[18] Though stunting is typically studied in children <5, stunting during adolescents may occur as rapid linear growth occurs during the adolescent years.[18] However, stunting in adolescents reflects the profound impact malnutrition causes during the lifecycle.

Unfortunately, once an adolescent suffers from obesity, overweight, and/or DBM, they are at a significantly increased risk of developing several NCDs as an adult (assuming they did not develop diabetes or another NCD as a child or adolescents). The prevalence of type 2 diabetes mellitus (T2DM) and hypertension (HTN) in Mexican adults are 15.7% and 30.2%, respectively.[10] Much like children and adolescents, adult overweight and obesity are correlated with the increased consumption of UPFs, SSB, salty and sugary snacks, and alcohol consumption.[10] Traditional food consumption has decreased significantly as the consumption of fresh fruits and vegetables, legumes, nuts, and whole grains have decreased dramatically as UPFs and SSBs account for ~30% of total daily energy intake.[10] Alarmingly, SSBs account for 9.8% of total daily energy intake yet provide 69% of added sugar in the modern Mexican diet.[10]

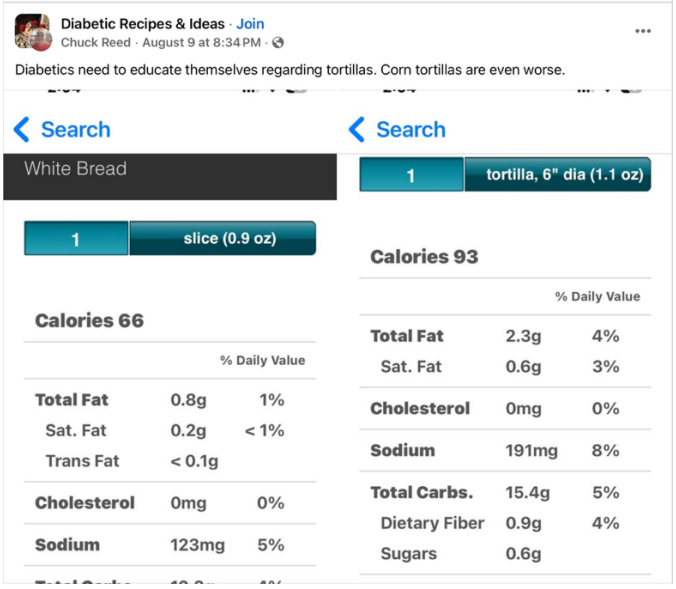
In older Mexican adults ages ≥60 years, metabolic risk factors and NCDs are primarily responsible for loss of health.[19] A longitudinal study found that 53.1% of older adults suffer from

HTN, 27.3% suffer from T2DM, 16.3% suffer from rheumatoid arthritis, 11.6% from heart disease, 6.9% from respiratory disease and 3.2% from cancer.[19]

Lastly, pregnant Mexican women consume ~27% of total calories from UPFs, which may put them at risk of gestational DM and preeclampsia.[20] The consumption of SSB may increase the risk of gestational HTN.[20] Women who suffer from pre-pregnancy obesity and consume UPFs may be at significant risk for DBM.[20] Alarmingly, researchers found that there may be a correlation between stunting in Mexican children and overweight or obese mothers as 53.3% of children with stunting have overweight or obese mothers.[21] This again underscores the devastating impact of the DBM on children and pregnant mothers.

VIII. Nutrition Misinformation & Cultural Competency

The post I chose was written from a member of the Facebook group *Diabetic Recipes & Ideas*. Here is a screenshot of the post and post caption:[22]



The individual who posted this is implying, in a condescending and harsh tone, that tortillas are "bad" for diabetics. The post author then states that "corn tortillas are even worse." This is blatant nutrition misinformation, lacks nuance, and clearly shows the individual who

posted this has no knowledge of carbohydrate exchanges, does not understand that all foods can fit in a dietary pattern, nor knows how to build a diabetes meal that includes tortillas. The tortilla in the post photo contains 15.4g of carbohydrates, which is roughly one carbohydrate exchange and can absolutely be incorporated into the dietary pattern of an individual who suffers from T2DM.

The author of the post is fearmongering and may lead others to believe that they must avoid tortillas altogether if they suffer from T2DM. This is simply not the case. Diabetic individuals *can consume* both flour and corn tortillas, provided they understand how to count their carbohydrate exchanges and have received nutrition education to understand *how* to build their meals with foods they enjoy. One small 6-inch corn tortilla counts as one carb exchange and one 6-inch flour tortilla (or 1/3 of a large 10-inch across tortilla) counts as one carbohydrate exchange.[23]

If this post reached Mexicans and/or Mexican Americans, it is harmful as tortillas are a staple food and consumed daily in many Mexican and Mexican American households. Using my family as an example, a tortilla is served with *every* meal.

The messaging that "tortillas are bad" is not only insulting to the Mexican culture but may cause Mexican and Mexican Americans to simply "give up" in trying to manage their diabetes as they may feel that they will be told they can't eat cultural foods due to their diagnosis.

We, as future RDNs, must help individuals incorporate their cultural foods into their overall dietary patterns, regardless of their health diagnosis.

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