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Dietary Quality among Latinos: Is Acculturation Making us Sick?

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Latinos, defined herein as individuals coming from Spanish or Portuguese speaking countries in Latin America and the Caribbean, have made and continue to make major economic, social, cultural, and political contributions to the USA (1). Yet, they are disproportionately affected by poor educational attainment, higher poverty and food insecurity rates, lack of access to health-care, and suboptimal health outcomes (2). These disparities occur in the context of neighborhoods or living environments with low social capital and major structural barriers preventing the practice of healthier recommended behaviors, including proper nutrition (3).

It is estimated that 78% of Latinos speak mostly Spanish at home (4). This strong language preference has led some to believe that Latinos can be understood as a monolithic group. However, Latinos can not be understood as a homogenous group as they come from very diverse socio-cultural contexts. In addition, their move to the USA has been driven by different social, economic, and/or political reasons (2). The objective of this commentary is to: a) present and discuss recent evidence on the association between acculturation, household food insecurity and dietary quality among Latino subgroups; b) make recommendations for improving the measurement of the construct of acculturation; and c) make specific research recommendations for advancing the knowledge in this field.

Latinos: Demographic Profile

Currently there are close to 44 million Latinos in the USA. It is estimated that 64% of Latinos are of Mexican origin, 9% Puerto Rican, 7.6% Central American, 5.5% South American, 3.4% Cuban, and the remaining come from diverse countries of origin. According to the US Census Bureau, Latinos living in the USA represent at least 20 different Latin American countries and the Caribbean, with 40% having been born outside the USA (5). Although Latinos still concentrate predominantly in the southwest (California, Texas), southeast (Florida), and the northeast (New York and New Jersey), fast growing Latino communities have emerged over the past years in all regions of the USA, and in many states where historically, Latinos have not had a significant presence until recently. For example, the five states experiencing the highest Latino growth rate between 2000 and 2006 were Arkansas, Georgia, South Carolina, Tennessee, and North Carolina. Likewise, about 5% of the population in Alaska, and 8% of the population of Hawaii identify themselves as Latinos showing the rapid growth of Latinos even in the more geographically distant states of the country (4).

Between 2000 and 2006, Latinos accounted for half of the nation's population growth, and demographic projections indicate they will account for the majority of population growth in the USA in the decades to come. Between the years 2010 and 2050, Latinos are expected to grow from 48 million (15.5% of US population), to 103 million people (24.4% of US population). By 2050 Latinos will represent 17% of the elderly population living in the US (4).

Compared to European-Americans, Latinos experience significantly higher rates of poverty, food insecurity, depression, lack of leisure-time and related physical activity, obesity, and serious chronic conditions such as type 2 diabetes (11). However, the diversity in country (and

sub region) of origin is reflected in substantial differences among Latino subgroups for several socio-economic indicators, lifestyle behaviors (e.g., dietary habits, physical activity, smoking); proximal risk factors (e.g., obesity, hypertension), and health outcomes (e.g., infant mortality, type 2 diabetes) (6-10). Lifestyles and health outcomes among Latinos are also likely to be affected by the level of acculturation, which is defined in this article as “the process by which Latinos adopt the attitudes, values, customs, beliefs, and behaviors of the mainstream ‘American culture’ (12).

Dietary Quality among Latinos

This issue of JADA includes two studies examining nutrition and health outcomes among Latin American and Latino children. One focuses on blood pressure among school aged children in Mexico City (13), and the other examines the relationship between diet and obesity among Latino children and adolescents in Houston, Texas (14). Both studies show that dietary quality is very poor in these samples of low-income urban children. Wilson et al. (14) applied two non-consecutive multiple pass 24-hour recalls per child in their predominantly Mexican-American sample. They found that both overweight (i.e. $\geq 95^{\text{th}}$ sex- and age-specific reference BMI percentile) and non-overweight children followed a dietary pattern characterized by low intakes of fruits and vegetables, coupled with excessive high fat foods and high sugar foods/beverages. The authors concluded that the main dietary practice difference between overweight and non-overweight children was the amount of calories consumed, and not the quality of their diets. This finding however has to be interpreted with caution as 73% of the households provided overweight and non-overweight siblings to the study. Thus, this study likely reflects dietary intake differences among children sharing the same family foods. The dietary quality problems associated with these children are similar to those of children from different race/ethnicities. However, because of the role that acculturation may play in shaping lifestyles, it is important to examine how this construct influences changes in dietary choices among Latinos.

Acculturation and Dietary Behaviors: Why Context Matters

An interesting finding from the study by Wilson et al. (14) was that sodium intake was related to the level of acculturation of the child. After controlling for child age, sex and BMI status, it was suggested that dietary quality among Latino children may be compromised as they assimilate more into the USA ‘mainstream’ culture. This is consistent with findings from many studies showing that acculturation among Latinos has a negative influence on breastfeeding, infant feeding practices, as well as on the quality of the diet consumed by children, adolescents, and adults (11,15). This fact has been interpreted as an indication of the positive lifestyle behaviors associated with the Hispanic culture that need to be protected so that they don’t ‘wash out’ as the individuals and families get more exposure to the USA ‘mainstream’ culture. The study by Colin et al. (13), however, suggests that this may be a simplistic interpretation of the evidence as the children in their study, recruited from 23 different public schools in Mexico City, had high consumption of calories from fat, a very high occurrence of being overweight, and incidences of high blood pressure. Assuming that the vast majority of those children had not lived in the USA before would suggest that the urbanization and the influence of globalization, experienced by Mexico during the past decades, is associated with the dramatic lifestyle changes and the high prevalence of overweight in that country (16,17). Indeed, the percent of children, adolescents, and adults who are overweight and consuming high levels of unhealthy processed foods and drinks/sodas are remarkably high and comparable in Mexico and the USA (16,17).

Consistent with the blood pressure findings from the study by Colin et al. (13) in Mexico City, a child lipid profile study in a northern Mexican city identified major risk factors for

cardiovascular disease early in life (18). What this means is that acculturation research among Latinos in the USA needs to take into account the place where people grew up in their home countries. This distinction can strongly modify the influence of acculturation on dietary habits and related health outcomes. For example, it is reasonable to expect that if children, such as the ones studied by Colin et al. (13) were to move to the USA, acculturation to the new environment may not be related to certain dietary practices and related outcomes as they would already be arriving with many USA 'mainstream' food habits. By contrast, if immigrants move to the USA from relatively traditional rural areas in Mexico and other Latin American and Caribbean countries/territories, as is often the case, then it is likely that exposure to the USA will bring about rapid and dramatic changes in their dietary practices and other lifestyle behaviors. This concept could be extended to differences in broad cultural norms in different countries or territories of origin. For example, whereas the vast majority of women in Latin American countries initiate breastfeeding, the proportion of women initiating breastfeeding is lower in Puerto Rico than in the continental USA (19). Thus, the expectation is that once they move to the USA, the influence of acculturation must be more pronounced for women moving from Mexico or other Latin American countries than for Puerto Rican women, and this is what has been empirically demonstrated (11).

Acculturation, Household Food Insecurity, and Dietary Quality

Food insecurity has been associated with suboptimal child health and development, depression and obesity among adults, especially women (20,21). Thus, achieving food security, (defined as 'access by all people, at all times, to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life,' (20)) among vulnerable groups should be a national priority. Unfortunately, food insecurity continues to be highly prevalent among Latinos (20). Although food insecurity was not associated with lower dietary quality in the Wilson et al. study, this construct has been associated with this outcome in a number of studies (22,23,24).

An important question that remains unanswered is whether food insecurity is associated with acculturation among Latino immigrants because it is possible that the longer they live in the USA the more likely they are to develop the networks and improved status to access better food safety nets in times of need making them more food secure. Consistent with this hypothesis, a study conducted in Northern California examining dietary patterns among Mexican-American preschoolers, found that lower parental English proficiency was associated with a higher likelihood of household food insecurity (24). By contrast, an NHANES analysis among 4-16 year old Latinos does not support this hypothesis. This analysis suggested that household food insecurity was associated with higher levels of acculturation (25). In this study, acculturation was measured based on language preference of the children's parents. Clearly, more studies are needed to better understand the relationship between acculturation, food insecurity, and dietary quality in Latino households.

Improving the Measurement of Acculturation

There is no doubt that acculturation has to be understood as a very dynamic longitudinal process involving complex interactions between the individuals and the different environments in which they live at different stages of their lives (26). This requires the rethinking of how to go about measuring the acculturation construct (11).

The process of acculturation has generally been conceptualized and measured in most studies as a linear and unidirectional process (i.e., immigrants moving away from their traditional culture and eventually adopting the mainstream culture), virtually excluding the possibility of individuals becoming multicultural (11). This is a major methodological weakness as individual Latinos who are bicultural, i.e. that can function well in both Hispanic and the

'mainstream' American cultures, are perhaps most likely to have positive economic and health outcomes. Thus, it is important that future research studies seeking to understand how acculturation shapes dietary habits use valid acculturation scales and view the construct of acculturation as multidirectional (27,28). These scales should allow researchers to classify Latinos into one of the following four mutually exclusive categories: (a) *Assimilated*: Latinos may end up completely giving up their Hispanic culture and totally assimilating into the 'mainstream' American culture; (b) *Integrated or bicultural*: Latinos may choose to strongly retain their Hispanic culture at the same time that they fully integrate into the mainstream culture; (c) *Separated*: Latinos may end up choosing to retain their Hispanic culture without attempting to integrate in the mainstream culture; i.e., becoming "separated" or "segregated"; and (d) *Marginalized*: Latinos may end up losing their Hispanic culture without seeking integration into the mainstream society, with little sense of belonging to any culture (11). In sum, acculturation proxies frequently used in the literature (e.g., place of birth, time in USA, language preferences) do not capture the whole complexity of the acculturation process. And often times different acculturation proxies yield inconsistent results even within the same study (11). It is important to test and validate existing multidirectional scales that allow for the classification of study participants into meaningful acculturation categories.

Conclusions

Because of the complex and dynamic nature of the acculturation process, longitudinal studies that take into account the life experiences of immigrants before moving to the US and control for important socio-economic, demographic, and biocultural confounders, are needed. It is important that future studies examining the link between acculturation, household food insecurity, and dietary quality among Latinos also include biomarkers (29). A good example of the application of biomarkers in dietary intake research is provided in the article by Spruijt-Metz et al. (30) also included in this JADA issue. In this randomized controlled cross-over trial the researchers sought to understand if and how diets with different macronutrient compositions affect physical activity, *ad libitum* dietary intake, as well as plasma glucose, insulin and leptin levels among 11-12 year old overweight Latinas. Although this study was not related to acculturation or food insecurity, the methods used are relevant for understanding potential biological mechanisms mediating the possible relationships between acculturation, household food insecurity, dietary quality and chronic diseases, including type 2 diabetes, that disproportionately affect Latinos and other minority groups.

In sum, acculturation is likely to negatively affect the dietary quality of Latinos, especially those coming to the USA from rural areas. However, we still need to elucidate the mechanisms and the extent to which acculturation to the USA 'mainstream' culture *per se* explain deterioration in dietary quality, and increased risks for obesity and associated chronic diseases among Latinos. Filling in this gap in knowledge is essential for developing culturally appropriate and behavioral change based interventions targeting Latinos with different levels of acculturation (12,31,32). For this end, studies need to take into account the social, economic, and built environment context in which acculturation takes place. Further progress in this multi- and inter-disciplinary field will require substantial improvements in: study design, statistical analysis approaches that can quantify neighborhood, household and individual level effects, measurement of the acculturation construct, and the use of biomarkers and molecular biology methodologies.

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