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Socioeconomic and Racial/Ethnic Disparity in Americans' Adherence to Federal Dietary Recommendations

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Racial/ethnic and socioeconomic disparities in obesity and other chronic diseases are constant features of the U.S. population and warrant continuous research on the linkage and causation between social demographic factors and distant health outcomes, and on related interventions. Many have believed that the racial/ethnic and socioeconomic disparity in dietary intake is an important intermediate factor contributing to the disparities in obesity and other lifestyle-related diseases (1). Kirkpatrick et al. provide some new evidence on differences in food-group-based dietary intakes across race/ethnicity and income groups in terms of meeting the US Department of Agriculture (USDA) dietary recommendation guidelines (2, 3).

Complex factors from the individual- to societal levels affect people's dietary intake (4). At individual level, cultural and inter-personal/social factors can influence the under-the-skin psycho-biological factors to influence dietary intake (see Figure 1). Race/ethnicity and socioeconomic status are two representative factors at cultural and social levels for an individual. The existing literature has documented the persistent racial/ethnic or socioeconomic disparities predominantly by focusing on intakes of nutrients (5, 6), with very few focused on food groups (7); and few have examined the relationship between sociodemographic characteristics and adherence to food-based national dietary recommendations. Food groups, which often pose more challenges for researchers to use, provide more tangible targets for policy makers and researchers to implement interventions to reduce the disparities in dietary intakes.

Studying consumption of food groups can be challenging though is useful and more informative to the general public. Unlike most nutrients that are consumed daily, some food

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groups are consumed sporadically. For example, 52% and 24% of Americans did not consume any dark-green vegetables or deep-yellow vegetables, respectively, on an average day (8). Even among individuals who ate certain food groups, the distribution of amounts could be highly skewed. These distributions create two barriers to understanding the sociodemographic disparities in food consumption. First, since most dietary survey data rely on the 24-hour recalls, the observed differences in food group consumption across individuals could reflect the disparity in race/ethnicity or socioeconomic status (SES), but may also reflect within-person variations in food consumption. Another barrier is to the validity of multivariate regression analysis, a standard analytical tool for public health researchers to examine health disparities. The large number of zeros and highly skewed data invalidate the assumptions of the most commonly used regression analyses, which further invalidates their statistical inference and conclusions. Afifi et al. reviewed available adjustments to validate regression analyses (9). However, they noted these adjustments were usually used by economists and health services researchers, but rarely by other public health researchers.

The National Cancer Institute (NCI) group developed a nonlinear two-part model to account for the skewed distributions in food group consumptions (8), and Kirkpatrick et al. applied the NCI methods to estimate the distribution of food groups and percentage of populations meeting the USDA recommendations across race/ethnicity and income groups (2). Given the strengths in their methods, their study provides new evidence for researchers and policy makers to understand the disparity in dietary intake and food consumption across race/ethnicity and income groups. Despite its importance, this paper was but an initial step to improve our understanding of disparity in adherence to national food group recommendations, given the skewed data. More advanced analyses can help overcome the limitation in their pairwise descriptive tests, which was burdensome and not comprehensible for readers (2).

Kirkpatrick et al. (2) reported several interesting findings related to the disparity in adherence to national food consumption recommendations. First, a striking racial/ethnic gap existed in meeting the recommendation for milk. About half of non-Hispanic white (NHW) children, one-third of Mexican American (MA) children, but only 15% of non-Hispanic black (NHB) children met the minimum recommended level. The racial disparity in milk consumption among adults was more dramatic: NHW adults were 6 times more likely than NHB adults in meeting the recommendation, and 50% more of that of MA adults. Kirkpatrick et al. (2) suggested genetics as one of the major explanatory factors, but we suspect this cannot explain the striking difference in the disparity between children and adults.

Second, significantly higher proportions of MA adults and children met the recommended minimum level of dry bean consumption, which was approximately 9 times and 12 times of those among their NHW peers, though they did not discuss the interesting result. People of Hispanic origin are the largest consumer group of cooked dry beans (10). With the increasing number of immigrants of Hispanic origin, the food culture in the ethnic group can not only be preserved but may also possibly spill over to other ethnic groups. Acculturation may not be a one-way phenomenon.

Third, the proportions of adults and children meeting the US federal dietary recommendations in the lowest and middle income groups were similar or almost identical. This is surprising, and may also reflect the limitation of income grouping as an analytical category. They used 130% and 185% poverty income threshold as cutoff points for lowest, middle and highest income groups. This grouping could be confused with the traditional concept of income groups, especially the definition of “middle income” groups. There is

continuous debate about the optimal measure of the poverty in the US (11). However, household income below 185% of the poverty income ratio was an important indicator of poverty and has been used in many anti-poverty initiatives and programs. For example, one of the eligible criteria for the Women, Infants and Children (WIC) program is household income below 185% of the federal poverty level. Moreover, many states use the “below 185% of the federal poverty level” line as the income eligibility cut-off for Medicaid. Therefore, the status of people with households below 185% of the federal poverty line can be regarded as “poor” or “near poor”. Americans living in poverty shared similar characteristics, including food consumption and adherence to the USDA recommendations. Due to the limitations of income measurement, researchers may consider alternative measurements of SES, such as education and occupation. That the lowest and middle income groups were similar in meeting the USDA dietary recommendations may indicate the federal assistance programs help reduce the income disparity in intakes, although more causality studies are needed to strengthen this argument.

In addition, the socioeconomic disparity in meeting the USDA recommendations among US children was smaller than that among adults. For some food groups, such as total vegetables, orange vegetables, dry beans, starchy vegetables, and meat and beans more children below the 185% federal poverty line met the recommended minimum levels than children above that line. These results are encouraging and support the effectiveness of the variety of child-oriented food assistance programs, such as WIC, school meal programs and the Child and Adult Care Food Program (CACFP).

Although Kirkpatrick et al.’s study (2) mainly aimed to examine the disparity in food intake across race/ethnicity and income groups, their results reflected the “equality” of these subpopulation groups in failing meeting the USDA recommendations. Except total grains, other vegetables, and meat and beans, less than 50% of adults across race/ethnicity and income categories adhered to the recommended consumption in many food groups. It is also concerning the majority of American children failed meeting the USDA recommendations for almost all food groups, except total grains. Even for some foods consumed daily, such as milk, only one-third of American children met the recommendations. The study sent an alarming message to policy makers and researchers that to improve adherence to the USDA recommendations is a priority to promote public health. A more systematic approach, from the society to individual households, is needed to implement effective interventions to promote healthy eating.

Further research needs to examine the interactive effect of racial/ethnic and socioeconomic disparities in adherence to national food consumption recommendations. Since racial/ethnic minority groups are traditionally more disadvantaged in SES, it is important to understand the contributions of SES and other factors in adherence to the dietary recommendations, such as culture, nutritional knowledge, stage of readiness to change, and health awareness. Different from what many have expected, our recent study (1) suggested that nutritional knowledge or health awareness hardly explained the disparity in the quality of dietary intake (assessed using the USDA healthy eating index) across race/ethnicity. However, income and education could explain a significant portion of the racial/ethnic differences. For example, income and education could explain 29.6% of the disparity between NHB and NHW adults and a significant 62.0% of the disparity between Hispanic and NHW adults (1). It will be interesting to examine the changes in racial disparities in adherence to the USDA food recommendations controlling for SES.

More research is needed to fully understand the racial/ethnic disparities in dietary intakes to guide well-designed and targeted interventions to eliminate the disparities. While research on the racial/ethnic and socioeconomic disparities in adherence to the USDA dietary

recommendations is valuable, more intervention efforts are needed to help reduce the disparities, in particular, to promote healthy eating among the most disadvantaged groups.

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Figure 1. Individual level factors that affect dietary intake

*Adapted from Booth et al. (2001)