

Factors that Impact Food Security in Northern Plains American Indians

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Introduction

Food insecurity definitions have been based upon the 1996 World Food Summit's definition. "Food security, at the individual, household, national, regional and global levels [is achieved] when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life." (Jones et al, 2013). The absence of one of these factors would be defined as food insecurity (Jones et al, 2013). In the US, the United States Department of Agriculture (USDA) defines food insecurity as a household-level economic and social condition of limited or uncertain access to adequate food (USDA, 2020). Food security status has multiple contributing factors with race/ethnicity and household size having the largest impact (Coleman-Jensen, 2016). Households with children, especially under the age of six, had a higher prevalence of food insecurity compared to households without children (Coleman-Jensen, 2016). Little variation was found by geographic region, although the South showed the greatest prevalence of food insecurity (Coleman-Jensen, 2016). The current study examined food security in Northern Plains American Indians in the Midwest. In the current study a number of measures of depression, anxiety, quality of life were taken along with demographic measures that have been associated with food insecurity in previous research.

Methods

Participants were self-identified American Indians residing in North and South Dakota, Minnesota, Montana and Wyoming who attended powwows in the summers of 2002 and 2003. The Core Food Security Module (CFSM) developed by the USDA was used to assess food insecurity in this population. Since its update in 2012, the module is now known as the U.S. Household Food Security Survey Module. The 18-item questionnaire was composed of 3 household-referenced questions, 7 adult-referenced questions, and 8 child-referenced questions. If no child under 18 lived in a participant's household, only questions referencing adults and the household were answered. The score total was used to categorize household food security status into 4 groups: food-secure (a score of 0–2, regardless of having children), food-insecure without hunger (a score of 3–7 with children or a score of 3–5 without children),

moderate food-insecure with hunger (a score of 8–12 with children or a score of 6–8 without children), and severe food-insecure with hunger (a score of 13–18 with children or a score of 9–10 without children). Based on the sum of scores, participants were placed into food secure (n=361), food insecure with no hunger (n=78), food insecure with moderate hunger (n=43), and food insecure with severe hunger (n=16). The Depression and Anxiety subscales from the Symptoms Checklist-90 (Derogatis, 1992) were used as measures of overall mental health. Measures for depression also included the Center for Epidemiologic Studies-Depression Scale (Radloff, 1977) and Beck Depressions Inventory-II (Beck, A. T., Steer, R. A., & Brown, G. K. (1996). Finally, total quality of life was measured with the Quality-of-Life Inventory (Frisch, 1999). Individuals participated at a mobile nutrition research laboratory parked the various powwows. Participants completed a variety of questionnaires while they were sitting at a table located in front of the laboratory. Individuals entered the mobile laboratory to have their height, weight and blood pressure taken.

Results

The participants were placed into one of four groups based upon their score on the Core Food Security Module. We chose to examine the impact of age, income, education, sleep, body mass index (BMI), number of children and adults living in each household, the Beck Depression Inventory-2 (BDI-2) and a measure of Quality of Life Inventory (QOLI) on food security. Complete data on all measures was available on 283 participants, resulting in 205 participants placed into food secure group, 53 participants in the food insecure with no hunger group, 20 participants in the food insecure group with moderate hunger, and 5 participants in the food insecure with severe hunger. A simultaneous multiple regression was conducted examining the effect of Age, Income, Education, sleep, number of adults and children in the home, BMI, BDI-2 and QOLI on food security, and the results are displayed in Table 1. The unstandardized regression coefficient (b) indicating the amount of change in the criterion variable that occurs for each unit change in the predictor, standardized regression coefficient (β) indicating the amount of a standard deviation (SD) change in the criterion variable that occurs for each SD change in the predictor,

and the part correlation squared indicating the percent of variance uniquely accounted for by the predictor. The results indicate that more children living in the household was associated with worse food security. Also increases in depression was associated with worse food security. The results also indicated that increases in income and QOLI scores led to higher food security.

	b	Beta	Part r ²
Age	.006	.105	0.009216
Income	-.056*	-.151	0.016384
QOLI	-.010*	-.181	0.022801
BDI-II	.012*	.148	0.015625
BMI	.006	.069	0.004761
Sleep (in hours)	-.049	-.047	0.002116
Education	-.045	-.099	0.0081
No. Children in Home	.054*	.124	0.014641
No. Adults in Home	-.014	-.023	0.000441

Discussion

The percentage of the participants identifying as food insecure was 26.3% for all completed Food Security Modules and at 27.56% for all who completed Food Security Modules available for the multiple regression analysis, was nearly twice the US average (Coleman-Jensen et al, 2015). This data is in line with the findings of Coleman-Jensen et al (2015) that race and ethnicity is related to food insecurity. Considering these findings show a comparable or greater percentage of food insecurity than most other races (Non-Hispanic blacks, 26.1%, Hispanics, 23.7%, Other, 11.7%, and Non-Hispanic whites, 10.6%), the American Indian population can be seen at greater risk for food insecurity (Coleman-Jensen et al, 2015). Overall, this study shows food security is more prevalent in Northern Plains American Indians compared to the general US populations. Several factors possibly contribute to lower food security including lower income, higher scores on depressive scales, lower scores on quality-of-life inventories, and having a higher number of children in the household. These associations show the need for further research in this population to better identify risk factors for food security.