The Relevancy of Community-Based Methods: Using Diet within Native American and Alaska Native Adult Populations as an Example

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Abstract

The rates of obesity, diabetes, and heart disease in Native Americans and Alaska Natives far exceed that of the general US population. There are many postulating reasons for these excessive rates including the transition from a traditional to a contemporary diet. Although information on the dietary intakes of Native American and Alaska Native communities are limited, there seems to be a consensus that the Native American and Alaska Native diet is high in total fat, saturated fat, cholesterol, and sodium. Further information on the diet needs to be attained so that dietary interventions can effectively be implemented in these communities. An approach that is community based is proposed as the best solution to understanding the Native diet and developing culturally tailored interventions to sustainably improve diet. Clin Trans Sci 2012; Volume 5: 295–300

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Introduction

The Healthy People 2020 has a renewed focus on alleviating health disparities among the US population.[1] Health disparities occur when differences in health status are closely linked to a social, economic, and/or environmental disadvantage.[1] The recognition of health disparities has evolved in tandem with the adoption of the research paradigm of translational research. This paradigm grew from the desire to link the discoveries of molecular and clinical scientists to applications benefiting patients and the public. For these translational linkages to occur and reduce disparities among subgroups, an appreciation for the benefits of community-engaged research methods needs wider adoption.

Community-based participatory research (CBPR) has been able to effectively reduce and/or eliminate the marginalization of communities on the basis of race, ethnicity, gender, or class.[2,3] CBPR can decrease the cultural gap, allow for cultural context to be applied and trusting relationships to be forged.[2–4] This use of local knowledge and lived experiences enhances the relevance, use, quality, and validity of data.[3–6] Working closely with the community and employing community members strengthens study design and implementation.[4,5] A partnership forged with diverse expertise, which is a tenet of CBPR, has the potential to more effectively address complex problems.[6,7]

Diet and nutrition are important indicators of health, hence their inclusion in the objectives for Healthy People 2020.[1] There is an extensive body of literature validating the premise that diet plays a role in health. Diet composition affects the risk for type 2 diabetes,[8] certain types of cancer,[9,10] and coronary heart disease (CHD).[11–13] Obesity is associated with an imbalance in energy intake relative to expenditure.[14] The diseases most commonly related to health disparities such as heart disease, diabetes, and chronic liver disease, are linked to dietary intake. Balancing the many decisions that individuals need to make each day, there are few activities more salient to all people than dietary choices.

The purpose of this paper is to provide a framework to researchers for applying CBPR to a population group known to experience health disparities. Drawing from historical, cultural, and current health research on Native Americans and Alaska Natives, the advantages of using CBPR is outlined to guide the design and implementation of nutrition programs among this population.[15] Information related to the Native American/Alaska Native diet from traditional to modern times and the dietary interventions that have been implemented among Native American/Alaska Native communities will be reviewed. Issues that have impacted dietary assessment and influenced interventions within Native communities will be discussed. Suggestions on how to improve health outcomes through the use of community-based models will be offered as a solution. A specific example drawn from these concepts will bring these principles to life to emphasize that reversal of health disparities within disadvantaged populations, such as Native Americans/Alaska Natives, requires community involvement.

Health Profile

Prior to contact with Europeans, Native Americans, and Alaska Natives were generally considered to be free of chronic and infectious diseases.[15,16] Today these same populations exhibit poor health outcomes relative to the larger US population. Self-reported rates of hypertension, CHD, and diabetes are higher among Native American/Alaska Native respondents in comparison to other ethnic groups.[17] One of the highest rates of type 2 diabetes in the world has been documented in the Pima of Arizona.[18] Excessive rates of obesity have also been observed in Native People.[19–21]

Many theories have been proposed to explain the dramatic changes in the health profiles of Native Americans/Alaska Natives. One theory is that health profiles for these groups have been negatively impacted by outside social influences such as high rates of poverty, displacement, and a loss of connection to their traditional cultural context, alcoholism, depression, and inadequate healthcare.[22–24] For example, social influences unique to Native American populations would be the US government's legacy of broken treaties and historical misconduct.

These outside social influences and subsequent lifestyle changes substantially impact dietary behaviors, an influential component to overall health.[25] And since diet is important in the maintenance of health and the etiology of disease,[26] understanding dietary profiles is essential, as many of the leading causes of death are diet related.[27] Changing dietary profiles of Native Americans/Alaska Natives, as well as other marginalized

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groups (e.g., immigrants) are part of a larger picture of dramatic changes in the health profiles for these groups.

Traditional Diets

The Native American/Alaska Native traditional food system (TFS) included all food within a particular culture available from local, natural resources and was culturally accepted.[28] TFS incorporated sociocultural meanings, acquisition and processing techniques, use, composition, and nutritional consequence for consumption.[28] These foods were dependent on seasonality, although preservation techniques such as smoking were used.[29] All of the essential nutrients necessary were provided as long as traditional methods were followed.[30,31]

As interaction with colonization forces increased, the Native American/Alaska Native diet transitioned. For example, the indigenous people of the southwest found that their TFS, which formerly consisted of corn, beans, squash, melons, mutton, goat, a variety of wild plants, game, and herbs, were being replaced by reservation commodity foods.[25,32] Quantitative analysis of trace elements in the teeth of 16th century versus contemporary (1970s) Hopi children found marked differences in tooth composition of strontium, a marker of traditional foods[33]; and less than one quarter of Hopi women and children recalled consuming a traditional dietary food item in a 24-hour period.[34]

Many reasons are cited for the transition away from traditional foods. Colonization influenced drastic demographic changes. Many Native American/Alaska Native communities were forced from their traditional homelands and onto reservations or into urban areas.[28,35] Enacted legislation restricted access to traditional food resources and harvesting areas. The onset of industrialization and modernization increased concern for the presence of contaminants.[36,37] The forced determination and imposition of outside, modern perspectives undermined the traditional foundations of these populations. Attempts to forcibly convert these cultures to more European-centric mores led to an interruption in the knowledge transfer across the generations. Coinciding with these forces, the increase in the availability and use of processed foods as a result of necessity (e.g., commodity food distribution) as well as an increased concern of self-support through employment ventures restricted engagement in traditional food acquisition.[28,35] This *nutrition transition* has been documented in the United States and the world.[38]

Epidemiology of Current Dietary Intakes Among Native Americans/Alaska Natives

Initially, information on the diets of Native Americans/Alaska Natives was gained through qualitative assessments by nutritional anthropologists. Prior to 1996, only eight studies were published that quantitatively assessed the Native diet.[39] Within the last two decades there has been considerable movement to enrich modern literature regarding Native American/Alaska Native dietary intakes.

The modern assessment of the Native diet suggests that the nutrition transition has been detrimental. Analysis of dietary intakes from select Native American/Alaska Native adult populations to the Dietary Guidelines for Americans, 2005 (DGA 2005)[40] shows that these populations are not meeting recommendations for a healthy lifestyle (see *Table 1*).[41–52] For most of the communities assessed, intakes of fat, saturated fat, cholesterol, and sodium exceed DGA (2005). Further, suboptimal intakes of micronutrients have also been documented.[41–43,47] These dietary practices place these communities at risk for chronic diseases such as diabetes and heart disease.[8,11,12]

Summary of Interventions among Native Americans/Alaska Natives

Examinations of Native American/Alaska Native diets have resulted in the conclusion that current diets are not meeting the recommendations for overall health.[40] Although multiple interventions across First Nations of Canada and Native Hawaiian communities have occurred to improve overall dietary behaviors,[35,53–59] relatively few published interventions have taken place among Native Americans/Alaska Natives.

In a review by LeMaster and Connell,[60] of the 19 health education interventions evaluated, only four emphasized improving nutrition to reduce disease risk in Native American/Alaska Native adult communities. The interventions reviewed included two community wide exercise-education programs that used goal-setting and incentives that modestly improved physical activity and diet.[61,62] In the Winnebago and Omaha, nutrition education minimally reduced blood sugar and weight.[63] Nutrition education was also found to improve diabetes care and decrease weight at Fort Totten, North Dakota.[64]

Separate intervention programs were also implemented in the Pima and an urban community of Native American women. In the Pima, a program implemented as a randomized clinical trial that emphasized Pima history and culture and self-directed general learning improved dietary intake better than a structured nutrition intervention based on behavioral theories.[65] In the community of urban Native American women, a nutrition intervention that used the Social Cognitive Theory in combination with culturally appropriate content improved diet and decreased waist circumference.[66] Findings from these interventions suggest that adding culturally appropriate content enhances desired outcomes.[66]

Issues that Influence Dietary Assessment and Intervention Progress

A primary factor that influences dietary assessment and intervention efforts among Native populations is the incomplete "bank of information" on their dietary intakes. This may be due in large part to two main issues: the historical and cultural contexts of Native People, and the methodological challenge of examining the Native diet. The paucity of information on dietary intakes may be an indication of the manner in which the history and culture of Native American/Alaska Native communities have been incorporated into nutritional assessments and/or interventions.[65,67] History has a profound impact on shaping the future of a people and culture influences the way a person views environmental control, biological variability, social organization, communication, personal space, and time orientation.[68]

Basis for mistrust

American indigenous groups have been plagued with previous unethical research experiences.[60,69] These experiences have led to general reluctance to participate in research efforts from outside institutions.[60,69] Repairing and then maintaining positive relationships with Native People will be an important element in future efforts to build an accurate profile of the dietary intakes of Native People. Recognizing the unique historical context of these population groups is an important initial step.

Native American/Alaska Native study population	*n*	Age range (years)	Mean energy intake (kcal/day)	Total fat (% kcal)	Saturated fat (% kcal)	Cholesterol (mg/day)	Sodium (mg/day)	Fiber (g/day)
DGA, 2005 (Ref. 40)			N/A	20–35%	10% or less	<300 mg/day	<2,300 mg/day	>20 g/day
Strong Heart Study (SHS)*,† (Ref. 41)	3,482	45–74						
Men								
AZ			1,907	34	12	398	3,143	N/A
OK			2,067	36	13	356	3,544	N/A
ND/SD			1,942	36	12	383	3,608	N/A
Women								
AZ			1,623	34	12	304	2,717	N/A
OK			1,708	35	12	265	2,879	N/A
ND/SD			1,624	34	12	275	2,858	N/A
Havasupai* (Ref. 42)	92	18–59						
Men			2,467	35	N/A	N/A	N/A	N/A
Women			2,389	35	N/A	N/A	N/A	N/A
Navajo Health & Nutrition Survey* (Ref. 43)	985	20–59						
Men								
		20–39	2,127	34	11	388	N/A	15
		40–59	2,066	35	12	403	N/A	14
Women								
		20–39	1,958	35	11	334	N/A	14
		40–59	1,708	34	12	320	N/A	13
Pima* (Ref. 44)	575	18–74						
Men			2,234	34	12	517	3,315	29
Women			1,813	36	13	430	2,787	23
Hualapai women* (Ref. 45)	28	18–35	2,602	35	13	N/A	N/A	N/A
Siouan§ (Ref. 46)	56	18–87						
Men			2,722	44	14	459	3,918	15
Women			1,643	47	15	290	2,231	8
Pacific Northwest Tribal Nations‡ (Refs. 47 and 48)	418	18+						
Men			2,524	36	12	364	1,178	15
Women			2,264	36	12	288	1,369	14
Lumbee women‡ (Ref. 49)	107	21–60	1,538	36	12	207	2,515	10
Alaska Natives (Northwest AK)* (Ref. 50)	433	25–65+						
Men			2,273	35	10	N/A	N/A	N/A
Women			1,899	36	10	N/A	N/A	N/A
Eskimo§ (Ref. 51)	850	17–60						
Men								
		17–39	3,150	35	12	493	N/A	16
		40–60	3,088	38	13	551	N/A	18
Women								
		17–39	2,684	37	12	369	N/A	14
		40–60	2,349	39	12	373	N/A	14

Native American/Alaska Native study population	*n*	Age range (years)	Mean energy intake (kcal/day)	Total fat (% kcal)	Saturated fat (% kcal)	Cholesterol (mg/day)	Sodium (mg/day)	Fiber (g/day)
Alaska Native women (Anchorage, AK)* (Ref. 52)			1,804	31	11	241	3,157	14

*Intakes estimated by 24-hour recall.
†Study sampled AI from AZ, OK, ND, and SD during Phase 2 of SHS.
‡Intakes estimated by dietary record.
§Intakes estimated by food frequency questionnaire.

Table 1. Modern mean dietary intakes of select groups of Native American/Alaska Native adults compared to Dietary Guidelines for Americans (DGA), 2005.

The history of Native Americans/Alaska Natives has been grouped into six phases.[70] These phases include pre-Western era, first contact with Westerners, economic competition for vital resources, invasion and war, subjugation, and forced placement on to reservations and into boarding schools with the ultimate goal of assimilation.[70,71] The history of Native People since contact has been characterized by a change from the traditional close connection between the land and culture, disruption of the family unit, and an impaired ability to pass on cultural practices and traditions.[70–73] The inherent sovereignty of these communities was undermined and for many not honored.[70] When health, social, and economic disparities are viewed outside of this historical context, there is the potential for these problems to be misunderstood and perpetuated rather than resolved.[67]

The role of culture

The cultural value system of Native people is rooted in a system quite different from the linearly framed Westernized views. Native Americans/Alaska Natives are now seen to be part of a high context culture whose thinking is circular in manner as a means to provide a strong sense of coherence and meaning.[67,74] This also applies to the difference in the language orientation between Natives and Westerners.[67,69]

Aboriginal values of health and wellness are also often viewed as holistic. Good health is the benefit of deeply intertwined harmonious interpersonal relationships with the environment.[31,75] Traditional views of illness often do not abide by the germ-theory or Western medical practice but rather subscribe to the view that events occur as a result of past or future occurrences.[27] Living a traditional lifestyle based on reciprocity, respect, sharing, and maintaining harmony with the human, natural, and spiritual realm is often highly valued in Native populations and associated with better well-being.[74,76] Many Native communities believe that the increase of chronic disease has occurred due to decreases in tradition and traditional foods, the loss of culture, and/or the loss of morale.[28,74]

The role of food in Native American/Alaska Native culture has often been dictated by the belief that balance with the environment is necessary. For many, a relationship existed between humans, animals, the physical and spiritual world.[77] Humans and animals were dependent on each other for survival and required a relationship of respect. Among the Quileute, the bones and head of the first salmon caught were thrown into the river to ensure good will of the salmon spirits.[78] This was also meant to symbolize taking only what was needed and served as a reminder to strive for balance.[77]

Food is a significant source of Native identity, central to cultural expression, and participation.[31,79] There is pride associated with being traditional and not eating the "white man's food."[77] Many believe that traditional, "whole" foods are superior to "processed" foods because they have better taste, are more nutritious, keep hunger satiated longer, and/or increase physical health.[74] For many, traditional food is a source of health, often referred to as medicine.

Methodological issues of examining diet in Native American/Alaska Native communities

Table 1 lists nutritional epidemiological investigations of Native American/Alaska Native communities. A majority of the over 500 federally recognized and 200 unrecognized Native American/Alaska Native communities residing in this country have not been assessed.[80] In national surveys, Native Americans/Alaska Natives are grouped into one homogenous category despite their geographic, cultural, and historical diversity. Therefore, the current dietary profile available for Native Americans/Alaska Natives is not a conclusive picture of these populations' diets. Only two prospective cohort studies have been initiated and/or completed to investigate the link between diet and disease solely in this population.[20,81–83]

Community-Based Models: Proposed Solutions

The type of effort that is needed in Native American/Alaska Native communities is one that seeks to examine diet through a process that is viewed and anchored through "Native lenses" and is sensitive to the sociocultural and historical experiences of Native People. CBPR emphasizes research/intervention being tailored with the target population and respects their social and structural determinants of health. For a comprehensive review of CBPR, see Israel et al.[84]

Health is influenced by history and defined within a given culture (values and norms).[85] CBPR offers an opportunity for researchers to engage in a process that emphasizes unique community and cultural factors to understand the dynamics of diet and health in Native communities. Culture is a representation of both past and present experiences. It is a people's shared history, language, and psychological lineage carried across generations. Using CBPR, knowledge is produced through and connected to a population's culture and history.[85–87] Approaches that emphasize culture and history to empower a community are believed to work the best within collectivists' cultures that have experienced significant disempowerment, such as Native Americans/Alaska Natives.[88] This type of knowledge will directly benefit the community and provide the basis for the acquiring and application of vital resources to address identified dietary/health needs unique to that community.[84,89] There is tremendous potential to produce findings that can guide the development

of further research, intervention, and policy change. CBPR has successfully been used to assess chronic disease-related risk factors in a Southwestern Alaska Native community.[88]

The principles of CBPR provide a framework for researches to understand the dynamics of diet in Native communities. However, establishing and maintaining trust, the foundation of CBPR, requires significant time and effort. Also, developing agreed upon CBPR principles, goals, and objectives can be challenging and further compounded by ethnic, cultural, social, and organizational differences between partnerships. Flexibility and compromise is necessary as the process works toward a fair distribution of resources and benefits.[89]

Applying Community-Based Concepts: A Hypothetical Case

Fry bread is a basic food of flour, salt, baking powder, and water fried in lard/oil, an outcome of commodity food distribution, and is consumed widely across Native communities. This simple food will be used to demonstrate use of community-based approaches within Native communities.

An objective evaluation of this high-fat, nutrient-poor food might lead a health professional to recommend its elimination from the diet of Native communities. However, through engaging the community it becomes apparent that the importance of fry bread goes beyond nutritional considerations. Fry bread has many positive and unique qualities. Fry bread is a representation of the historical legacy of Native People arising from the distribution of commodity foods.[90] Fry bread is a marker of history; it is symbolic of the journey of survival that Native People have made and represents their ability to cope with adversity. It has become a unifying item.[32,42–44,90–92] Eliminating fry bread would be ill advised and most likely unsuccessful due to its cultural and historical significance. However, modifying fry bread's preparation to improve nutrient content may be a more appropriate, sustainable option.[90] Community-based approaches can inform practitioners about the unique cultural practices, history, and traditions surrounding Native communities and lead to more sustainable behavioral change efforts.

Conclusion

Recognizing the profound implications of history, culture, and traditions on Native diets and other practices related to health will be essential to reduce the disproportionate level of disease in this population. Community-based methods provide a foundation of trust and hold promise to improve the validity, reliability, and usefulness of findings related to improving the health of disadvantaged groups. Developing a research process or designing an intervention under the direction of community-based methods, which emphasizes empowerment, can be a more effective way in which communities can improve their health.

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