


RESEARCH ARTICLE

Demographic and cultural correlates of traditional eating among Alaska Native adults at risk for cardiovascular disease

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has a population of approximately 9,500 between the largest town of Nome (population 3,600) and 15 communities with populations ranging from 150 to 900 residents [3, 4]. Approximately 76% of the population is of Alaska Native heritage primarily Inupiaq, Central Yup'ik and Siberian Yup'ik [5]. The traditional Alaska Native diet consumed in this region has been associated with many positive health outcomes such as improved lipid profiles, better glucose tolerance, and lower levels of obesity [6–8]. Further, previous studies have found that Alaska Native people who eat more traditional foods consumed significantly more vitamin A, vitamin D, vitamin E, Iron, and omega-3 fatty acids than those with largely nontraditional diets [9, 10].

However, as processed foods have become more prevalent in rural Alaska Native communities, consumption of these traditional foods by Alaska Native people has declined over time [11, 12]. The decrease in healthy-fat rich traditional foods has corresponded with an increase in simple carbohydrate consumption, obesity and chronic disease [13]. While cardiovascular disease differs by region in Alaska, in aggregate is responsible for nearly 1 in 5 deaths for Alaska Native men and nearly 1 in 4 deaths for Alaska Native women, and represents the greatest cause of death in Norton Sound [14]. Further, while cardiovascular disease mortality has declined in the U.S. overall, the rate of decline is less among Alaska Native communities [15, 16]. It has been postulated that perceived stress was a contributor to markers of cardiovascular disease (obesity, high blood pressure and high cholesterol) in American Indian and Alaska Native communities, but recent research found no such association suggesting the role of other lifestyle factors like diet as a potential mediator [17].

Federally-funded public health programs have targeted health disparities among at-risk communities such as the remote Alaska Native communities in the Norton Sound Region; however, relatively few efforts have incorporated community-based methods that emphasize traditional foods [18]. Beyond the health-promoting effects of many traditional Alaska Native foods, recent studies have highlighted the cultural and community benefits traditional eating may provide [19]. Prior research among indigenous communities has found that traditional eating increases feelings of connectedness to one's culture and community, which in turn has been associated with improved quality

criteria included: Alaska Native heritage; English literacy; age 19 years or older; residing in the Norton Sound region; currently smoking 5 or more cigarettes per day; with high blood pressure (systolic/diastolic BP \geq 140 mmHg/90 mmHg) or high cholesterol (LDL \geq 160) or currently prescribed antihypertensive or cholesterol lowering medication [5]. Individuals who were pregnant, currently in a tobacco cessation program, taking smoking cessation medications, or had a body mass index (BMI) $>$ 50 were excluded.

Measures

Diet was measured using a novel 34-item food frequency questionnaire (FFQ) (S1 File), which was adapted from a validated,

Table 1. Characteristics of participants (n = 291).

Characteristics	mean (SD ^a) or n (%)
Age in years, mean (SD)	47 (14)
Male, n (%)	147 (51%)
Female, n (%)	144 (49%)
Location, n (%)	
None (<3000 residents)	65 (22%)
Other community (<1000 residents)	226 (78%)
Surveyed by season, n (%)	
Summer (May–September)	140 (48%)
Winter (October–April)	151 (52%)
Alaska Native (self-identified), n (%)	
Inupiat	173 (59%)
Yupik	89 (31%)
Multiple or neither	29 (10%)
Hypertension, n (%)	234 (80%)
High cholesterol, n (%)	113 (39%)
Traditional consumption ^c , mean (SD)	5.2 (3.6)
Community connectedness ^c , mean (SD)	5.7 (2.6)
Community standing ^c , mean (SD)	5.3 (2.1)

^a = standard deviation

^b Data represent blood cutoffs determined with consultation of individual's family doctor with the region.

^c Self-report with ASCA from 1±10, with 1 being low and 10 being high.

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Fig 1. Participants' most frequent foods consumed, shown as times per week and grouped as traditional and nontraditional.

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traditional food index of 21% or a 1/5th of reported data consisting of traditional food. approximately

Associations with traditional food intake

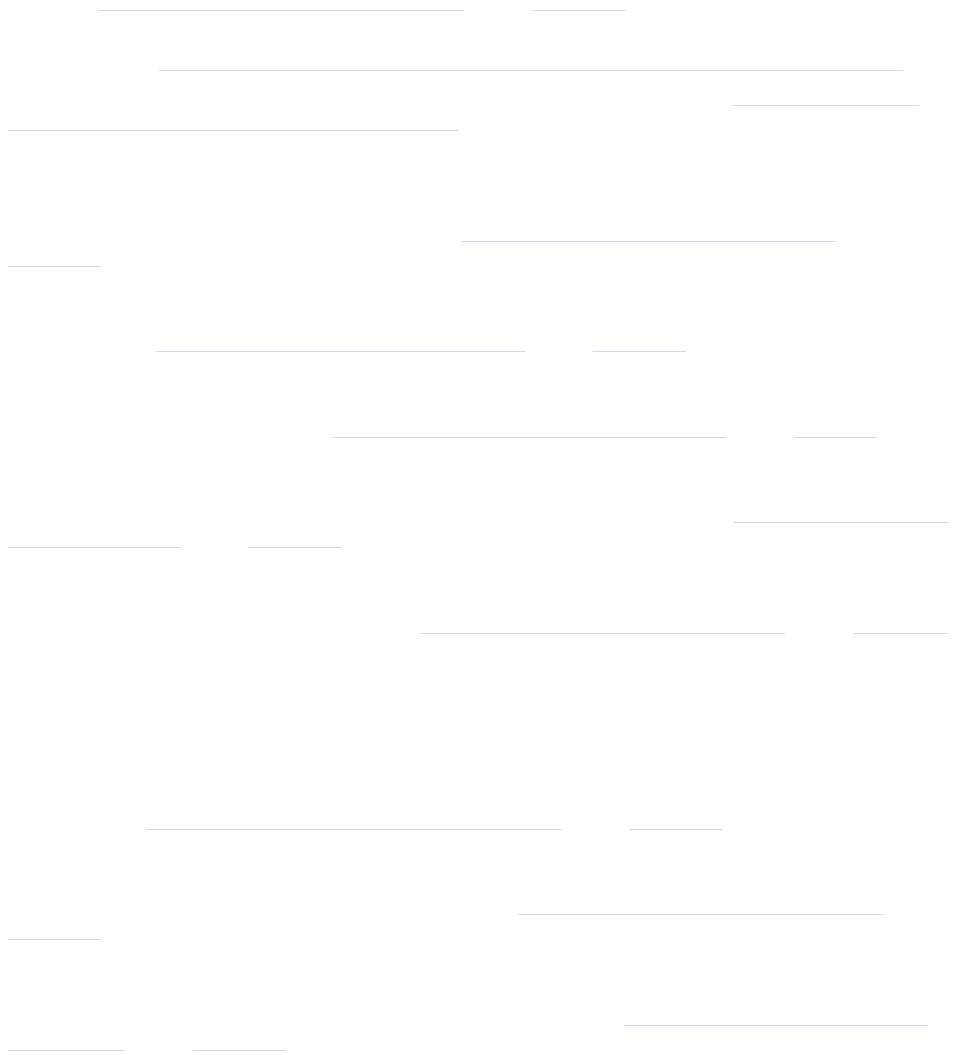
While causal relationships determined from these cross-sectional data is a limitation, the study found that those who reported eating more traditional foods reported greater satisfaction with their community. Factors that promote health and well-being [29,34].

Research on cultural community connectedness and health in India has shown positive associations for physical activity in multiple cross-sectional studies [30]. A study with African Americans found cultural identification with an increase in leisure-time physical activity, a healthier diet, and less smoking [31]. Research with indigenous populations, such as the Ndebele, has shown that traditional practices and beliefs are associated with better health outcomes [32].

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