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Cardiovascular Knowledge Among Urban American Indians and Alaska Natives: First Steps in Addressing Cardiovascular Health

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Abstract

Background—Cardiovascular disease (CVD) is common among American Indians/Alaska Natives (AI/ANs). Given limited access to health care, urban AI/ANs may be at particular risk. Lack of available data, however, limits our understanding of cardiovascular health in this population.

Objectives—We conducted a survey to characterize CVD-related knowledge, behavior, and risk of urban AI/ANs. Results related to knowledge are reported.

Methods—In collaboration with the Indian clinics in two urban communities, we surveyed 298 AI/ANs.

Results—Respondents recognized approximately half of the symptoms of heart attack and stroke, and were significantly less likely to recognize each symptom than reported in national studies using the same items. General CVD knowledge (e.g., risks of high blood pressure) was stronger, although areas for improvement were noted.

Conclusions—Urban AI/ANs would benefit from efforts to enhance CVD knowledge. These preliminary data are providing the foundation for community-based efforts to address CVD risk among urban AI/ANs.

Keywords

North American Indians; Cardiovascular Diseases; Knowledge; Community-Based Participatory Research; Urban Health; Behavioral Risk Factor Surveillance System

Cardiovascular disease (CVD), once rare in American Indians and Alaska Natives (AI/ANs),[1–5] is now more common among AI/ANs than the U.S. all-race population.[1, 6–9] Rates of fatal and nonfatal heart disease are two-fold higher for AI/ANs[1, 6] and major CVD risk factors are highly prevalent (e.g., smoking,[10–12] diabetes,[12–16] physical inactivity,[17] obesity[12, 17–20]).[9]

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As a result of federal policies designed to assimilate AI/ANs into mainstream American society in the 1950s and 1960s, most AI/ANs now live in urban areas.[21] Yet most health care resources for AI/ANs are located on or near Indian reservations. Although Title V of the Indian Health Care Improvement Act (PL. 94-437; 1976) targeted funding for urban Indian health care programs, these programs receive <4% of the Indian Health Service (IHS) budget, resulting in limited services.[21, 22]

Little information is available about health status among urban AI/ANs. This population typically is not included in IHS statistics[23] and public health surveillance systems capture only small samples of urban AI/ANs. Developing a clearer understanding of cardiovascular health among urban AI/ANs is an important first step in the development of interventions addressing CVD risk in this population.

The University of Colorado Denver's Center of Excellence in Eliminating Disparities (CEED) seeks to reduce CVD-related disparities in urban AI/ANs through collaboration with organizations serving AI/ANs in Denver, CO, and Albuquerque, NM. As an initial step in assessing community needs, we collected survey data to evaluate CVD-related knowledge, behavior, and risk among AI/ANs in these cities. This article describes results related to CVD knowledge. Although prior studies have shown racial/ethnic disparities in such knowledge,[24, 25] none has included AI/ANs. In this report, we describe disparities in CVD knowledge in an urban AI/AN sample and discuss how these results – in conjunction with other survey findings – are informing the CEED's community-based efforts to improve cardiovascular health among urban AI/ANs.

Methods

Early CEED activities focused on fostering existing partnerships and developing new connections with the Denver and Albuquerque AI/AN communities. Denver-based project staff became regular participants in the Service Delivery Advisory Council, an existing coalition with representation from organizations providing community, health, housing, educational, family, and social services to Denver-based AI/ANs. In Albuquerque, CEED staff developed the New Mexico CEED Coalition, which includes representatives from local AI/AN community organizations, diabetes and tobacco use prevention programs, the local tribal college and Title V Indian health clinic, the American Heart Association, IHS, and CDC.

Because the AI/AN communities in Denver and Albuquerque are geographically dispersed, survey participants were recruited through each city's Title V Indian health clinic. Initially, project and clinic staff developed a Memorandum of Understanding to clarify their respective roles in this work and worked together to finalize the survey approach. Clinic staff reviewed the proposed survey questions and protocol, and collaborated on refinement of recruitment and data collection procedures. In Albuquerque, clinic staff also were instrumental in the selection of a new CEED staff member to administer the survey.

The final sample included 298 AI/AN adults (150 from Albuquerque and 148 from Denver). Recruitment letters were sent to a sample of 300 patients from each clinic. Although no

formal randomization process was implemented, clinics sought to select a representative sample of current patients. Interested individuals contacted study staff, who confirmed eligibility (i.e., AI/AN, age 18–65, clinic encounter within past year) and scheduled study-specific visits at the clinic for survey completion. Participants were paid $20.

Procedures and Measures

Participants completed a written survey containing items assessing demographics and CVD knowledge (i.e., knowledge of heart attack/stroke, general knowledge of CVD risk).

Demographic Characteristics—Demographic data included age, gender, Hispanic/Latino ethnicity, education, and pre-tax household income.

Heart Attack and Stroke—So that we could compare knowledge in our sample to previously published data for U.S. adults generally, we measured knowledge of the symptoms of heart attack and stroke using items from the Behavioral Risk Factor Surveillance System (BRFSS).[26] BRFSS is a state-based, random-digit-dialed telephone survey of U.S. adults,[27] with demonstrated reliability of survey items[28–30] and behavioral risk factor estimates.[31] The BRFSS Heart Attack and Stroke Module is administered biennially in interested states.[32]

Respondents were asked to indicate whether five specific symptoms are warning signs of a heart attack and whether five specific symptoms are warning signs of stroke. In all cases, the symptoms presented were, in fact, hallmark symptoms of these conditions (see Table 1). Respondents answered “Yes,” “No,” or “Don’t Know/Not Sure” to each item. We examined accuracy of responses to each symptom (i.e., symptom was correctly recognized or not). We also computed two measures each of overall heart attack knowledge and overall stroke knowledge: (1) the percentage of heart attack (or stroke) symptoms that were correctly recognized and (2) the correct identification of all five symptoms of heart attack (or stroke). Whereas the first measure assesses breadth of knowledge, the latter represents the ideal level of knowledge and is commonly reported in studies using BRFSS data.

CVD Risk—Participants were asked to respond “Yes,” “No,” or “Don’t Know/Not Sure” to nine items assessing general CVD-related knowledge (e.g., risks associated with a high-sodium diet). Items were developed by the National Heart, Lung, and Blood Institute (NHLBI) to evaluate *Honoring the Gift of Heart Health (HGHH)*, a curriculum to promote heart-healthy lifestyles among AI/ANs. Because the CEED conducts HGHH-based trainings for providers and patients, items addressing HGHH content were included in the survey. Psychometric testing of these items has not been reported. We examined accuracy in the response to each item as well as the total percentage of items answered correctly.

Data Analysis

Descriptive analyses examined demographics as well as performance on each knowledge item and overall measure. We compared heart attack and stroke knowledge in this sample to the results of prior studies reporting national data for the BRFSS heart attack and stroke items.[24, 33–37] Large-sample Z tests between independent sample proportions were

conducted to determine whether the current sample differed from national samples in the proportion of participants recognizing each symptom and knowing to call 911 in the event of a heart attack or stroke.[38] Because national data are not available for the NHLBI items, a similar comparison for general CVD knowledge items was not possible.

Institutional Review

The protocol was approved by the institutional review board (IRB) of the University of Colorado Denver and the National IHS IRB. Participants provided written informed consent and Health Insurance Portability and Accountability Act authorization.

Results

Study Sample

Table 2 provides sample descriptives. Participants were 18–65, with a mean age of 38.6, a finding consistent with the relatively young age of Title V clinic users (approximately 50% of adult clinic users are aged 25–44).[39] Also like Title V clinic users generally, most participants were female (60.2% and 62.0%, respectively).[39] Nearly one quarter had less than a high school diploma or equivalent (compared to 17.6% of AI/ANs in Albuquerque and 22.5% of AI/ANs in Denver).[40, 41] Only 18.2% of participants reported an income of ≥ $20,000, suggesting that this sample of clinic users likely experienced greater financial limitations than urban AI/ANs living in counties served by Title V clinics, 24% of whom are living in poverty.[42] A small percentage of participants self-identified as Hispanic/Latino (10.2%).

Cardiovascular Knowledge

Table 3 presents heart attack and stroke knowledge in this sample compared to previously published data.[24, 33–37] On average, participants correctly identified 53.7% of heart attack symptoms, with only 16.2% recognizing all five symptoms. Although most participants recognized chest pain as a heart attack symptom, between one half and two thirds identified arm/shoulder pain and shortness of breath as warning signs, and <50% knew that jaw/neck/back discomfort and weakness/lightheadedness are symptoms of a heart attack. Participants had significantly lower levels of heart attack knowledge than seen in previous studies reporting 2001 and 2005 BRFSS data (all p values < 0.0001).[24, 34]

On average, participants identified 56.9% of stroke symptoms, with only 19.9% recognizing all five symptoms. As shown in Table 3, nearly three quarters of respondents accurately identified numbness/weakness as a warning sign of stroke, with approximately two thirds recognizing sudden confusion/trouble speaking and sudden trouble walking. Only a minority identified severe headache and sudden trouble seeing as stroke warning signs. Knowledge of stroke symptoms was significantly lower in this sample than in previous studies reporting BRFSS data from 2001, 2003, and 2005 (all p values < 0.0001).[33, 35–37]

Although knowledge of heart attack and stroke symptoms was limited, the majority of participants (85.9%) knew to call 911 if someone was having a heart attack or stroke (Table

3). These results were not significantly different from those of prior studies using BRFSS data. [24, 33–37]

On average, participants answered 73.6% of items related to general CVD knowledge correctly (Table 4). Most participants (> 80%) were aware of the risks associated with a high-salt diet, saturated/*trans* fats, overweight/obesity, and second-hand smoke, as well as the benefits of physical activity. Roughly two thirds were aware of the risks associated with a large waist and the benefits of a heart-healthy diet. Only a slight majority recognized lard as a high-fat food and <50% correctly identified a blood pressure of 140/90 as high.

Discussion

CVD knowledge was limited in this sample. Recognition of heart attack and stroke symptoms was significantly lower than in the general U.S. population. Although the majority of participants knew to call 911 in the event of a heart attack or stroke, most recognized only about half of the symptoms of these conditions, limiting their ability to respond appropriately to a serious cardiovascular event. Results also suggested limitations in general CVD knowledge, particularly knowledge that can facilitate understanding of cardiovascular risk (e.g., knowing whether a blood pressure value is high) and engaging in heart-healthy behavior (e.g., knowing whether lard is high in saturated fat). Although these results suggest significant limitations in CVD knowledge, findings based on a small sample from two clinics may not generalize to the entire urban AI/AN community. It is important to note, however, that knowledge items did not differ across the clinics (comparisons not reported), suggesting that similar patients from other urban clinics also might experience limited CVD knowledge.

Project staff are collaborating with our local AI/AN communities to identify strategies for enhancing cardiovascular health. The CEED team met with our local clinics and coalitions to review survey results related to CVD knowledge as well as CVD-related behavior and risk (not reported here). Using this work as a foundation, project staff and community partners identified interventions to improve cardiovascular health through improved knowledge, motivation, and access to healthy lifestyle choices. Strategies recommended by our partners included engaging community champions to facilitate CVD education and exercise classes; conducting wellness conferences at Powwows and other cultural events; developing educational materials and videos; and employing social networking and technology to enhance CVD-related knowledge and behavior. Through this process, we learned that our partners are inclined toward interventions targeting the individual, rather than strategies addressing environmental or policy change.

Several of these activities are well under development. In collaboration with IHS and several Title V health clinics, the CEED has conducted three national trainings to educate urban Indian health programs regarding CVD risk and management in AI/ANs, implementing the HGHH curriculum to increase patients' CVD knowledge, and using motivational interviewing to promote behavior change. Community partners also have worked with the CEED to develop posters addressing cardiovascular health for dissemination to organizations serving urban AI/ANs . Further, CEED staff are working with community

members in both cities to develop digital stories for national dissemination to enhance CVD knowledge and engagement in healthier lifestyles.

Important next steps include working with the community to assess the impact of current efforts, extending these approaches to other urban AI/AN communities, and educating our partners about use of environmental and policy change as a means of improving urban AI/AN health. Given the striking disparities in CVD knowledge in our sample and the high prevalence of cardiovascular risk factors and CVD itself in the AI/AN population generally, expanding our efforts nationally and promoting a focus on policy change will provide urban AI/AN communities with critical tools and strategies for enhancing cardiovascular health.

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Table 1

BRFSS Items Related to Heart Attack and Stroke Warning Signs

	Symptoms of Heart Attack
1	Pain or Discomfort in the Jaw, Neck, or Back
2	Feeling Weak, Lightheaded, or Faint
3	Chest Pain or Discomfort
4	Pain or Discomfort in the Arms or Shoulder
5	Shortness of Breath

	Symptoms of Stroke
1	Sudden Confusion or Trouble Speaking
2	Sudden Numbness or Weakness of Face, Arm, or Leg
3	Sudden Trouble Seeing in One or Both Eyes
4	Sudden Trouble Walking, Dizziness, or Loss of Balance
5	Severe Headache with No Known Cause

Table 2

Descriptive Characteristics of the Sample (N=298)

	Mean or %
Age	38.6
Gender: Female	62.0%
Ethnicity: Hispanic/Latino	10.2%
Highest Grade Completed	
< high school graduate	21.8%
High school grad/GED	25.2%
Vocational school	9.2%
Some college	32.6%
College degree or more	11.2%
Income	
< $5K	51.2%
$5K to < $10K	10.6%
$10K to < $20K	19.9%
$20K to < $40K	11.0%
$40K or more	7.2%

Table 3

Knowledge of Heart Attack and Stroke Warning Signs (N=298)

	% Accurately Identifying Each Symptom	
	Current Sample	**National Comparison Data**
Symptoms of Heart Attack [a]		
Jaw, Neck, or Back Pain/Discomfort	27.3%*	47.6% – 50.8%
Feeling Weak, Lightheaded, or Faint	41.8%*	61.7% – 65.0%
Chest Pain or Discomfort	78.4%*	92.1% – 94.9%
Arm or Shoulder Pain/Discomfort	57.3%*	85.1% – 88.9%
Shortness of Breath	64.1%*	87.3% – 93.4%
Overall Knowledge of Heart Attack		
% of Symptoms Correctly Identified	53.7%	---
% Correctly Identifying All 5 Symptoms	16.2%*	30.6%
Symptoms of Stroke [b]		
Sudden Confusion or Trouble Speaking	65.2%*	86.5% – 95.6%
Sudden Numbness or Weakness of Face/Arm/Leg	74.7%*	92.6% – 97.5%
Sudden Trouble Seeing in One or Both Eyes	47.3%*	68.1% – 88.3%
Sudden Trouble Walking/Dizziness/Loss of Balance	62.5%*	83.4% – 94.7%
Severe Headache with No Known Cause	34.1%*	60.4% – 81.6%
Overall Knowledge of Stroke		
% of Symptoms Correctly Identified	56.9%	---
% Correctly Identifying All 5 Symptoms	19.9%	---
What do if Someone Has a Heart Attack/Stroke [c]		
Call 911	85.9%	85.9% – 87.7%

[a] Accurate identification of each symptom of heart attack in the current sample was compared to previously reported studies using national BRFSS data.[24,34] Percentage of participants recognizing all five symptoms was compared with data reported using 2005 BRFSS data.[24]

[b] Accurate identification of each symptom of stroke in the current sample was compared to previously reported studies using national BRFSS data.[33,35–37]

[c] Recognition of the importance of calling 911 when someone is having a heart attack or stroke was compared with national BRFSS data.[24,33–37]

* $p < 0.0001$

Table 4

General Cardiovascular Knowledge: % Answering Correctly (N=298)

	% Answering Correctly
1. A large waist can increase your risk of heart disease.	65.3%
2. Foods high in sodium can increase blood pressure.	83.2%
3. Lard has a low amount of saturated fat.	59.7%
4. Saturated and *trans* fat can raise cholesterol levels.	81.8%
5. Blood pressure of 140/90 is considered high.	46.6%
6. Overweight/obesity can increase cholesterol.	91.6%
7. Physical activity can reduce the risk for heart disease.	87.6%
8. Only people with high cholesterol should follow a heart-healthy diet.	64.4%
9. Nonsmokers can die from second-hand smoke.	81.9%
Overall Accuracy Rate for General CVD Knowledge	73.6%