JADARA

Volume 40 | Number 1 Article 6

November 2019

Nutritional Health Among Deaf Adults

Neva L. Crogan
University of Arizona, College of Nursing

Elaine G. Jones

Youngmi Kang

NUTRITIONAL HEALTH AMONG DEAF ADULTS

Neva L. Crogan, Ph.D., Elaine G. Jones, Ph.D., and Youngmi Kang, M.S.
University of Arizona, College of Nursing

Abstract

The purpose of this study was to describe nutritional health of Deaf adults in terms of nutrition knowledge, eating patterns, and Body Mass Index (BMI). Fifty-seven Deaf adults in the Tucson and Phoenix, Arizona, metropolitan areas completed 3-day eating diaries, sections B and C of the General Nutrition Knowledge Questionnaire for adults, and were measured for height and weight for BMI. Analysis found an average score of 50% on the nutrition knowledge questionnaire, 33.10 % of dietary calories came from fat; less than 1 serving of fruit per day and slightly more than one serving of vegetables per day and most were overweight (average BMI 26.90).. Results support the need for culturally appropriate nutrition education to increase nutrition knowledge, improve eating patterns and encourage healthy weights among Deaf adults.

Introduction

The purpose of this article is to depict the nutritional health of Deaf adults by describing the relationships between nutrition knowledge, eating patterns, and Body Mass Index (BMI). The term "Deaf" refers to people who experienced a significant hearing loss at an early age, use sign language communication in adulthood and participate in social events and organizations with other Deaf community members (Padden & Humphries, 1988; 2005; Stebnicki & Coeling, 2002). The shared language of Deaf culture, American Sign Language (ASL) and the identification with Deaf communities unite Deaf persons as a unique linguistic minority and may simultaneously separate them in many ways from the hearing world.

Deaf persons' access to health-related information is limited by barriers to spoken or written language including limited access to television, radio and other sound-based channels for public information. Deaf adults may also have limited ability to read and understand written English, making written health information essentially inaccessible (Allen, 1994), including text-based internet information (Bowe, 2002, Zazove et al, 2004). In addition, communication with health providers (hearing doctors and nurses) is often difficult as the medical profession is typically inexperienced in accommodating the communication needs of Deaf people and have little understanding of Deaf culture (Barnett, 2002). Poor eating patterns and

overweight are significant health problems among American adults, leading to increased risk of chronic illness and disease, especially for cardiovascular disease (CVD). However, little is known about the nutritional health among culturally Deaf adults.

Background

There is general agreement in the literature that key behavioral factors in preventing CVD and other diseases include low-fat diets with adequate servings of fruits and vegetables, maintaining normal weight, regular exercise or regular, moderate physical activity, smoking cessation, and stress management to decrease perceived stress (American College of Sports Medicine, 2005; American Heart Association, 2006). Reducing risk for CVD is especially important as it remains the leading cause of death in the United States and many of the risk factors are modifiable.

The scientific position of the American Heart Association (AHA) is that reducing dietary saturated fat and cholesterol is effective to lower the risk of CVD in the general population. Since excessive serum cholesterol has been linked with CVD, interventions to decrease risk of CVD or reverse atherosclerotic processes are needed to focus on preventing or decreasing excessive cholesterol levels. Across race and ethnicity about 50% of Americans have total cholesterol levels over 200mg/dL. These levels are associated with increased risk for CVD (Gulanick & Cofer, 2000).

The Dietary Guidelines for Americans (2005) published every five years by the Department of Health and Human Services and the United States Department of Agriculture includes nine chapters that address the relationship between diet and chronic illness. The Guidelines mirror the scientific position of AHA by recommending that Americans choose a diet low in saturated fat and cholesterol and moderate in total fat. The total recommended intake of total fat should be 20-35% of calories with 10% from saturated fat. A diet high in saturated fats and cholesterol has been shown to increase the risk for CVD in most populations. Diets low in saturated fats and cholesterol lead to reduced CVD risk (AHA, 2006).

Fruits and vegetables are equally important in reducing CVD risk in the general population. In a 1990 report by the World Health Organization, the average diet should include 400 g of fruits and vegetables (5 servings

per day). This recommendation was further defined in 1997 by the World Cancer Research Fund with their recommendation that vegetables and fruit should provide 7% or more of total calories, or an intake of 400-800 g per day. These recommendations are consistent with the AHA Step 1 diet intended for primary prevention for persons whose fat intake is above the recommended level.

The AHA notes that obesity is now recognized as a major, independent risk factor for heart disease. African-Americans, Mexican-Americans, and Native Americans have somewhat higher rates of obesity than white/non-Hispanic groups (AHA, 2006). Obesity adversely affects all components of the lipid profile: a 5-10 pound weight gain in the average person can raise total cholesterol by 10 mg/dL (Oberman, Kreisberg & Henkin, 1992). The AHA recommends using Body Mass Index (BMI) as a measure of overall body composition. The Dietary Guidelines for Americans (2005) recommends that Americans aim for a healthy weight defined as a BMI from 19-24 kg/m2. A BMI from 25-29 refers to overweight and a BMI of 30 or more obesity. Being overweight or obese increases the risk for high blood pressure, high blood cholesterol, heart disease, stroke, diabetes, certain types of cancer, arthritis, and breathing problems (The Dietary Guidelines for Americans).

A literature search revealed no studies specifically addressing nutrition among Deaf persons. However, two descriptive studies of Deaf adults' health provide some evidence that nutrition knowledge, eating patterns and weight may be significant problems among Deaf adults as among the general population (Advocate Health Care-Sinai Health System [AHC-SHS], 2004; Jones, Renger & Firestone, 2005).

AHC-SHS (2004) collaborated to survey 203 culturally Deaf adults in the Chicago area about various aspects of their health including health knowledge and behaviors (Margellos-Anast, et al, 2005). The survey included questions about CVD risk factors and health habits. Surveyers did not ask directly about participants' height and weight or diets, but did ask if they thought they were overweight. Overall, about 44% of respondents said they were overweight. The researchers noted that the Deaf adults in their study were receiving health care from very Deaf-friendly organizations and that the health knowledge and health status of Deaf adults who had less access to health information were likely to be worse.

Jones, Renger and Firestone (2005) reported results of a Deaf community analysis to identify the health education priorities in Arizona Deaf communities. Results included analysis of interviews (in sign language) with 111 Deaf adults regarding CVD risk factors. Nearly half (49%) reported diets that were moderate-high fat, 43% were overweight (BMI>25), with more women than men who were obese. Although useful, these prior descriptive studies did not include data about the nutritional knowledge, eating patterns or BMI among their samples. The purpose of this article is to depict the nutritional health of Deaf adults by describing the relationships between nutrition knowledge, eating patterns, and Body Mass Index (BMI).

Methods

Sample and Setting

The sample was drawn from participants in a study to pilot test the Deaf Heart Health Intervention (NINR: 1 R15 NR008009-01). Selection criteria included: (a) 18 years or older and (b) self-identified as a member of deaf culture. Persons under 18 years of age were not eligible for participation because the content and teaching strategies of the intervention were designed for adults. The study was approved by the University of Arizona Institutional Review Board for Protection of Human Subjects prior to subject recruitment. The consent form was translated into ASL, presented to potential participants on videotape, and any questions were answered in sign language as part of the consenting procedure (Jones, Mallinson, Phillips, & Kang, 2006). Results presented in this article based on analysis of data from fifty-seven participants who completed baseline data collection for all three nutrition related measures: the general nutrition questionnaire, the 3-day eating diary and height and weight measures for BMI. Demographic characteristics are described in Table 1.

Deaf Heart Health Intervention

The Deaf Heart Health Intervention (DHHI) was designed specifically for Deaf adults and included content on CVD, heart-healthy nutrition, physical activity and exercise, smoking cessation, and stress management. The program was based on recommendations from the American Heart Association leading to primary prevention of CVD. The theoretical foundations for the DHHI are in social cognitive theory (Bandura, 1986, 1995); complemented with research findings about the preferred teaching-

learning strategies of Deaf adults (Lang, McKee, & Conner, 1993; Lang, Stinson, Basile, Kavanagh, & Liu, 1999), knowledge of Deaf life ways (Dolnick, 1993; Padden & Humphries, 1988, 2005) and community health worker literature. A number of health education programs targeting specific ethnic or geographic communities have successfully utilized lay community health workers drawn from the targeted community (e.g. Eng, Parker, & Harlan, 1997; Hill, Bone, & Butz, 1996) to encourage health behavior change among participants (Quinn & McNabb, 2001). The DHHI was taught by a trained, Deaf lay heart health teacher over an 8-week period of time for a total of 16 hours of in-class time. Program outcomes are reported elsewhere.

Study Measures

Eating Patterns

Participants completed a 3-day diary of their food and fluid intake which was then analyzed using the Nutritionist Five, First DataBank (1998). This program can analyze diets for up to 80 nutrients and includes over 15,000 foods/ingredients. The results of the diet analysis were compared to the nutrition targets in terms of fat content, number of servings of fruits and vegetables, and caloric intake matched to a healthy BMI (19-24 kg/m2).

Body Mass Index (BMI)

BMI was determined by dividing the person's weight (in kilograms) by their height in meters squared. The weight and height measures were taken using one balance scale calibrated to zero before each subject was weighed. Participants were measured in street clothes without shoes, in a location where the measures could not be viewed by others.

The General Nutrition Questionnaire for Adults

Each participant completed sections B and C of the sign-language version of the General Nutrition Questionnaire for Adults (GNQA) (Parmenter & Wardle, 1999). The questions were administered in sign language on video and answers were circled on an answer sheet, with answers represented in both words and pictures on the answer sheet. Pictures of food items were added next to each answer, assisting the participant to understand (visualize) the question more fully and to ensure that English literacy was not necessary to respond to the signed questions about foods. The sections of the GNQA chosen measure the ability to classify foods (Section B = 69 items) and skills in choosing everyday foods (Section C = 10 items).

Sections A (4 items about what advice experts give) and D (10 items about health problems or diseases) were not utilized due to incongruity with study aims. The internal consistency for all four sections range from alpha's of 0.70 to 0.94. Cronbach's alpha coefficient for the entire questionnaire is 0.97. Test-retest reliability for the full questionnaire is 0.98.

Results

Data were analyzed using descriptive statistics and mean scores of nutritional measures. Bivariate analyses included Pearson correlation coefficients of nutritional measures and Cronbach's alpha for internal consistency of measures of nutritional knowledge.

Nutrition knowledge

On average, participants scored 50% (39 of 79 items correct) on the nutrition knowledge questionnaire (Sections B+C). Mean scores are reported on Table 2. Participants who reported eating more fruit were found to have greater nutrition knowledge (Section C – skills in choosing everyday foods) (r=.32). Participants with a higher BMI also had greater nutrition knowledge (Section B – ability to classify foods into groups) (r=.31). Correlations among nutritional measures are shown in Table 3.

Eating patterns and BMI

Participants reported that on average 33.10% of their dietary calories came from fat. The number of servings of fruit each day averaged less than 1 (.64), for vegetables 1.14. Total daily servings of fruit and vegetables averaged 1.78. Average reported BMI was 26.90. Mean scores are reported on Table 2.

Internal reliability of the nutritional measures

Internal consistency of the nutritional knowledge scales (Sections B and C) was .89. Internal reliability of nutrition measures are shown in Table 4.

Discussion

In this study, most participants (67%) were white women, age 40 years or greater (72%), not married (59%), and had less than a high school education (65%). BMI averaged 26.90 (SD 5.28; range 16.04-38.47). A BMI from 25-29 refers to overweight and a BMI of 30 or more obesity (The Dietary

Guidelines for Americans). Poor diet and physical inactivity resulting in an energy imbalance (more calories consumed than expended), are important factors contributing to the increase in overweight and obesity. (The Dietary Guidelines for Americans). A high prevalence of overweight and obesity is of great public health concern because excess body fat leads to a higher risk for co-morbid conditions such as type 2 Diabetes, hypertension, CVD, stroke, gall bladder disease, gout, osteoarthritis and some types of cancers.

Participants in this study were at increased risk due to being overweight; plus they lacked the nutrition knowledge to make good food choices. Of concern, however, was that participants with higher BMI's also scored higher on Section B of the nutrition knowledge questionnaire suggesting that they may know how to classify foods, but choose to eat inappropriate amounts of food leading to weight gain. Section B measures the ability to classify or identify foods into groups.

Most reported eating less than one serving of fruit per day and slightly more than one serving of vegetables per day. Of interest, those that ate more fruit were more likely to have greater nutrition knowledge (Section C) (r=.32) suggesting that a primary prevention program aimed at improving nutrition knowledge may have a positive effect on nutrition knowledge, food intake, and subsequent nutrition health.

Conclusion

Additional studies are needed to further explore the relationship between eating pattern (actual behavior) and nutrition knowledge. Accommodating the physical and sociocultural dimensions of Deafness in a variety of primary prevention programs aimed at improving health status for Deaf adults are needed and should be investigated.

Neva L. Crogan, PhD, APRN, BC, GNP, FNGNA
Elaine G. Jones, PhD, RN, FNAP
Youngmi Kang, MS, RN, Doctoral Candidate
The University of Arizona
College of Nursing
Tucson, AZ

(520) 626-3770 Voice
(520) 626-7891 Fax
ncrogan@nursing.arizona.edu
ejones@nursing.arizona.edu
ykang@nursing.arizona.edu

References

Advocate Health Care & Sinai Health System. (2004, February). Improving access to health and mental health for Chicago's Deaf community: A survey of Deaf adults. Final Survey Report. [Electronic version]. Retrieved October 27, 2006 from http://healthtrust.net/index.php?option=com_content&task=view&id=29&Itemid=61

Allen TE. (1994). Why are the deaf and hard-of-hearing students leaving high school and entering postsecondary education? Paper submitted to Pelavin Research Institute as part of the project, A Comprehensive Evaluation to the Postsecondary Educational Opportunities for Students who are Deaf or Hard of Hearing, funded by the U.S. Office of Special Education and Rehabilitative Services. Available at the following web address: http://gallaudet.edu/~cadsbeb/whodeaf.html.

American College of Sports Medicine (2005). Accessible at web site http://www.ascm.org.

American Heart Association. (2006) accessible at web site http://www.americanheart.org,, accessed 10-17-06

Bandura, A. (1986). Social foundations of thought and action: A social cognitive theory. Englewood Cliffs, NJ: Prentice-Hall.

Bandura, A. (1995). Self-efficacy in changing societies, New York: Cambridge University Press.

Barnett, S. (2002). Cross-cultural communication with patients who use American Sign Language. Family Medicine. 34(5), 376-82.

Bowe, F.G. (2002). Deaf and hard of hearing Americans' instant messaging and email use: a national survey. American Annals of the Deaf 147(4): 6-10.

Dolnick, E. (1993, Sept). Deafness as culture. The Atlantic Monthly, 37-53.

Eng, E., Parker, E., & Harlan, C. (1997). Lay health advisor intervention strategies: A continuum from natural helping to paraprofessional helping.

Health Education and Behavior, 24(4), 413-417.

Gulanick M, & Cofer LA. (2000). Coronary risk factors: Influences on the lipid profile. Journal of Cardiology Nursing, 14(2), 16-28.

Hill, M.N., Bone, L.R., & Butz, A.M. (1996). Enhancing the role of community health workers in research. IMAGE, 28, 221-226.

Jones, E.G., Mallinson, R.K., Phillips, L., & Kang, Y. (2006). Challenges in language, culture, and modality. Nursing Research 55(2), 75-81.

Jones, E. G., Renger, R., & Firestone, R. (2005). Deaf community analysis for health education priorities. Public Health Nursing 22, 27-35.

Lang, H.G., McKee, B.G., & Conner, K.N. (1993). Characteristics of effective teachers: A descriptive study of perceptions of faculty and deaf college students. American Annals of the Deaf, 138(3), 252-259.

Lang, H.G., Stinson, M.S., Basile, M., Kavanagh, F., & Liu, Y. (1999). Learning styles of deaf college students and teaching behaviors of their instructors. Journal of Deaf Studies and Deaf Education, 4, 16-27.

Margellos-Anast, H., Hedding, T., Perlman, T., Miller, L., Rodgers, R., Kivland, L, DeGutis, D., GIloth, B., & Whitman, S. (2005). Developing a standardized comprehensive health survey for use with deaf adults. American Annals of the Deaf, 150 (4), 388-96.

Nutritionist Five (1998). First DataBank, computer software.

Oberman A, Kreisberg R, Henkin Y. (1992). Principles and Management of Lipid Disorders: A Primary Care Approach. Philadelphia, Pa: Williams & Wilkins.

Padden, C., & Humphries, T. (1988). Deaf in America: Voices from a culture. Cambridge, Massachusetts: Harvard University Press

Padden, C. & Humphries, T. (2005). Inside Deaf Culture. Harvard University Press: Boston.

Parmenter, K., & Wardle, J. (1999). Development of a general nutrition knowledge questionnaire for adults. European Journal of Clinical Nutrition, 53, 298-308.

Quinn, M.T., & McNabb, W.L. (2001). Training lay health educators to conduct a church-based weight-loss program for African-American women. Diabetes Educator, 27(2), 231-8.

Stebnicki, J.A. M. & Coeling, H.V. (1999). The culture of the Deaf. Journal of Transcultural Nursing, 10(4), 350-357.

The Dietary Guidelines for Americans (2005). U.S. Department of Health and Human Services,

U.S. Department of Agriculture. Available at the following web site: http:// www.healthierus.gov/dietaryguidelines.

Zazove, P., Meador, H. E., Derry, H.A. Gorenglo, D.W. Burdick,S.W. & Saunders,E.W. (2004). Deaf persons and computer use. American Annals of the Deaf. 148(5): 376-84.

Table 1: Demographic Characteristics (n=57)

Variable	N (%)
Gender	
Men	19 (33%)
Women	38 (67%)
Age	
Adult (18-40)	16 (28.1%)
Mature Adult (41-65)	21 (36.8%)
Older (66-90)	20 (35.1%)
Education	
Less than high school	37 (64.9%)
High school-College	5 (8.8%)
Graduate school	11 (19.3%)
Not Reported	4 (7.0%)
Ethnicity	
White	52 (91.2%)
Hispanic	1 (1.8%)
African American	2 (3.5%)
Asian	1 (1.8%)
Not Reported	1 (1.8%)
Living Situation	
Married/Partnered	21 (36.9%)
Single	34 (58.6%)
Not Reported	2 (3.5%)

Table 2: Mean Scores of Nutritional Measures (n=57)

	Mean (SD)	Range
Eating Pattern		
Percent of Calories from Total Fat	33.10 (8.24)	18.23-51.65
Daily Number of Servings of Fruit	.64 (.79)	0-4.70
Daily Number of Servings of Vegetable	1.14 (1.39)	.03-9.30
Daily Total Servings of Fruit/Vegetable	1.78 (1.74)	.03-10.53
BMI	26.90 (5.29)	16-38.47
Nutrition Knowledge		
Section B (69 items)	34.77 (8.95)	13-54
Section C (10 items)	4.75 (1.88)	1-9
Section B+C	39.53 (10.25)	17-62

Table 3: Correlations among Nutritional Measures (n=57)

Measures	Eating Patterns				BMI	Nutrition Knowledge *r (p)*		
	% of Calories *r (p)*	#Fruit *r (p)*	#Veg. *r (p)*	#Total Fruit/Veg *r (p)*	*r (p)*	Section B *r (p)*	Section C *r (p)*	Section B + C *r (p)*
Eating Patterns								
% of Calories	-	-66 (.63)	.02	-.01 (.92)	.03 (.81)	-.24 (.07)	-.22 (.10)	-.25 (.62)
#Fruit	-.66 (.63)	-	(.88)	.62* (.00)	-.07 (.59)	.10 (.46)	.32* (.02)	.15 (.28)
#Vegetable	.02 (.88)	.21 (.11)	.21	.90* (.00)	.14 (.29)	.12 (.38)	.15 (.28)	.13 (.33)
#Total Fruit/Veg.	-.01 (.92)	.62*	(.11)	-	.08 (.55)	.14 (.30)	.26* (.50)	.17 (.20)
		(0.0)	-					
			.90*					
			(.00)					
BMI	.03 (.81)	-.07	.14	.08 (.55)	-	.31* (.02)	.02 (.87)	.28* (.04)
		(.59)	(.29)					
Nutrition Knowledge	-.24 (.07)	.10 (.46)	.12	.14 (.30)	.31*	-	.64* (.00)	.99* (.00)
Section B	-.22 (.10)	.32*	(.38)	.26* (.50)	(.02)	.64* (.00)	-	.74* (.00)
Section C	-.25 (.62)	(.02)	.15	.17 (.20)	.02 (.87)	.99* (.00)	.74* (.00)	-
Section B+C		.15 (.28)	(.28)		.28*			
			.13		(.04)			
			(.33)					

* Significant level at the .05 (two-tailed)

Table 4: Internal Reliability of Nutritional Measures (n=57)

	Number of Items	Cronbach's Alpha
Nutrition Knowledge		
Section B	69	.92
Section C	10	.12
Section B+C	79	.89