The Black Seventh-Day Adventist Exploratory Health Study

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African Americans are at high risk for stroke and dementia. Modifications of lifestyle, however, might lower this risk. The Seventh-Day Adventist (SDA) Church encourages both spiritual adherence and a healthy lifestyle. Members are encouraged to exercise and are discouraged from smoking, drinking alcoholic or caffeinated beverages, or eating meat. The present study describes an exploratory project in 2 Black SDA congregations ($N=82$) designed to characterize the lifestyle, dietary, and spiritual health habits of these congregations, and to test the feasibility of collecting such information in the Black SDA community at large. Three separate data collection methods are described and evaluated. Data demonstrate that the sample differs significantly from the African-American community at large in dietary, lifestyle, and spiritual health habits. The Black SDA community represents a unique opportunity to test the effects of diet, lifestyle, and spirituality on risk for stroke and dementia. (*Ethn Dis*. 2003;13:208–212)

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Introduction

A healthy lifestyle is associated with longevity. For example, persons who consume foods recommended by current dietary guidelines (fruits, vegetables, whole grains, low-fat dairy, and lean meats and poultry)[1] and exercise regularly[2] have a decreased risk of mortality. Abstention from cigarette smoking and heavy alcohol consumption also may be associated with decreased morbidity and mortality from major diseases, including cerebrovascular and cardiovascular disease, as well as cancer.[3,4] In the United States, Blacks have the highest mortality for most major diseases, with stroke being one of those most disproportionately affecting Blacks.[5] Excess mortality among Blacks may be explained, in part, by a higher prevalence of cardiovascular disease and stroke risk factors, such as hypertension, smoking, obesity, and diabetes mellitus.[4,5]

The Seventh-Day Adventist Church emphasizes both spiritual and lifestyle adherence to its tenets.[6] Members are encouraged to engage in church activities, and are discouraged from smoking, drinking alcoholic or caffeinated beverages, or eating meat. In studies of non-Hispanic White Adventists, adherence to the Adventist lifestyle has been associated with reduction in fatal coronary heart disease events, whereas obesity has been associated with non-fatal myocardial infarction.[7]

Due to the paucity of information on Black Adventists, an exploratory study of Black Seventh-Day Adventist health habits was performed. The purpose of the study was to: 1) characterize this population's health, dietary, and spiritual habits; and 2) test the feasibility of collecting such information in this population as a springboard to developing and testing hypotheses concerning dementia, stroke, and, possibly, cardiovascular disease and cancer in a large scale cohort study of this group.

Methods

Initial Steps

The Lake Region Seventh-Day Adventist Church group was chosen for study. The Lake Region represents 14 churches and comprises approximately 7,040 Black members in the Chicago metropolitan area. The goals and the nature of the project were explained to the Council President and the Lake Region pastors, and the study received their endorsement. An advisory board consisting of prominent members of the church community was established. Such a board was critical to the success of previous projects[8] by providing community oversight and guidance. Board members were chosen by the president and other Lake Region pastors. The board members included a physician, a nurse, a school administrator, and the president.

The study team chose 2 Lake Region congregations in the Chicago area. One congregation was located in a middle-class area of the south side of Chicago, and the other in a lower income area, on the west side of Chicago. The study team first met with each congregation's pastor to explain the project and ask permission to approach the congregation. The study team then spoke directly to congregation members during a Sabbath service. This communication consisted of an introduction to the

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study, an explanation of the work already completed with the pastor and community advisory committee, and an invitation for members who met eligibility criteria to participate in the study.

Enrollment Methods

Three enrollment methods were explored. The first was to hand out to all church members pre-addressed, stamped postcards to be completed and mailed by those who wished to participate in the study. The second method was to use the most current church directory to contact randomly selected congregation members for participation, and the third method was to return to each church to make a second announcement regarding the study, and then stay after the service to sign up members who wished to participate.

Trained interviewers made telephone contact with every 9th member in the church directory at the larger first church and every 6th member in the directory at the smaller second church. If they got to the bottom of the list, the interviewers were instructed to start at the second name from the top and again move down to every 9th or 6th member, respectively. The telephone interviewers asked the respondents about their interest in participating in the telephone survey, discussed the nature of the survey, and explained the consent form to the respondents. Those respondents who gave verbal consent of interest in participating were mailed a consent form which was reviewed, signed, and returned by the respondent before the main phase study questionnaire was administered, either by telephone or in the home of the respondent. The overall study and the study consent were approved by the Rush Medical Center Institutional Review Board (IRB).

Study Questionnaire and Inclusion Criteria

The exploratory questionnaire was designed for the respondent to report first on herself/himself, then to provide information on up to 2 family members who met study entry criteria. We sought approximately 80 respondents, 40 from each church. The survey consisted of items such as church membership and spiritual life, medical history, alcohol use, smoking habits, and dietary habits, patterned after one of the authors' prior health study questionnaires,[9] and modified in collaboration with the Lake Region advisory board. Trained interviewers administered the survey almost exclusively by telephone.

Study inclusion criteria required participants to be at least 40 years old, self-identified as Black, a baptized member of the Seventh-day Adventist Church, and able and willing to provide oral and written informed consent. A $50.00 honorarium was given to study subjects.

RESULTS

Enrollment Methods

The yield from the postcard enrollment method was low. Only 33 cards were returned to the study center, from the 200+ cards that were dispersed. This method, therefore, was abandoned. The directory method met with better success; however, it was found that the directories were not up-to-date. This method, therefore, was combined with the third method, which was to return to each church, make another announcement regarding the study, and sign up members who wished to participate. Often, members who signed up were not listed in the church directory. The church secretaries from both churches were also helpful in updating the directories.

Participation Rates

Researchers at the west side church, while unable to verify all eligible subjects by conferring with church staff, identified 136 members who met eligibility criteria. Forty-one members participated in the study. There were no refusals or other circumstances that arose to prevent participation from this church. However, incomplete or inaccurate telephone information for 25 (18%) members was observed, explaining investigators' initial inability to identify all eligible members. After the interviewing process was completed, the church staff were queried about these 25 members and found that about 40% of these persons were no longer members of the church. At the second church (south side), which had a much larger membership with many more directory listings, church staff did not determine the eligibility of the subjects. Rather, every 9th person was called for eligibility. At this church, 41 persons participated, 2 refused participation, 12 did not return telephone calls, and 2 had incomplete or inaccurate telephone information.

Demographic Information (Table 1)

The average age of the study group was 57.4 years. There were no significant differences in the ages of respondents compared to the ages of persons reported by respondents ($t[112] = -1.20$, NS). The average number of years of education for the entire sample was 13.0. Again, no difference was observed between the education level of respondents and that of persons reported by respondents ($t[112] = -.75$, NS). Thirty-nine percent of the sample was older than age 59 (mean age of this subgroup was 70.2 years). Seventy-two percent of the study group were women.

Table 1. Demographic information

Variable	Mean (SD)	Median	Range
Age, entire sample (*N*=114)	57.4 (12.1)	55	40–94
Age, respondents (*N*=82)	56.6 (10.7)	55	40–83
Age, persons reported by respondents (*N*=32)	60.0 (15.1)	54	40–94
Age >59, (*N*=44)	70.2 (7.7)	69	60–94
Education entire sample (*N*=114)	13.0 (3.8)	13	0–20
Education, respondents (*N*=82)	12.9 (4.0)	13	0–20
Education, persons reported by respondents (*N*=32)	13.5 (3.5)	14	6–20
Education, persons >age 59 (*N*=44)	11.8 (4.2)	12	0–20
Women (%)	72		

Medical History and Health Habits

Relatively few persons reported a history of myocardial infarction (6.1%), stroke (2.6%), or other neurological disorders. However, hypertension (43.8%), hypercholesterolemia (23.0%), and diabetes mellitus (15%) were common. A history of cancer was reported by 21.1%.

Of the study group, 26.3% reported to be vegetarian and 65% reported to exercise on a regular basis. Few respondents were current smokers (3.5%), or drank more than one alcoholic beverage each day (0.9%).

Dietary Intake (Table 2)

A low frequency of eating meat was reported by the study group. Vegetable-based meat substitutes or analogues were consumed by 85% of the study group. Overall, the study group reported a high frequency of grain (95.6%), fruit (100%), and raw (94.9%) or cooked (100%) vegetable consumption.

Spiritual Health Demographics and Habits (Table 3)

Of note, approximately half of the study group are first generation Seventh-Day Adventist members, and the average age at baptism is 26.2 years, suggesting that a relatively high percentage of respondents were converts to the church. Respondents exhibited a high degree of spirituality, as measured by the average number of church services attended during the past year (50.8), the percentage of persons who engaged in private prayer on a daily basis (95.1%) and the percentage of persons who attended prayer meeting at least monthly (57.3%). Most attended prayer meetings at least monthly, with 26.8% participating weekly, 20.7% participating 2–3 times per month, and 9.8% participating once per month.

Table 2. Dietary habits (in percent)

	Consumption Frequency		
Variable	Never	Sometimes	Regularly
Caffeinated beverages	68.1	22.1	9.7
Meat analogues, substitutes	15.0	48.7	36.3
Beef or lamb	56.1	33.3	10.5
Pork	97.4	1.8	0.9
Poultry or fish	18.4	36.0	45.6
Grains	4.4	22.8	72.8
Dry beans	2.6	21.1	76.3
Breads, cereals, rolls	0	29.2	70.8
Raw vegetables	6.1	25.6	69.3
Cooked vegetables	0	7.9	92.1
Fruit	0	8.8	91.2

DISCUSSION

The Seventh-Day Adventist (SDA) Church was founded in the mid-1800s, primarily by former adherents to the Millerite movement, who had expected the imminent second advent of Jesus Christ. Early in its history, the church espoused the keeping of the seventh day (Saturday) Sabbath and propounded a health message which included total abstinence from the use of tobacco, alcohol, caffeinated beverages, in addition to such foods as pork and shellfish. Through the readings of Ellen G. White, a pioneer leader who is believed to have exercised the prophetic gift in the church, a comprehensive set of lifestyle admonitions have become a significant aspect of SDA teaching. While it is not mandated, a vegetarian diet is recommended, as is a balance of rest and exercise, fresh air, the free use of water, temperance, and an abiding trust in Divine power. The health benefits resulting from such practices are believed to enhance the capacity to commune personally with God, and to increase one's ability to be of service to God and to others. Basic religious practices of Seventh-day Adventists are much like those of other Protestant groups, including Sabbath School and Divine worship services, prayer meeting, and summer camp meeting. Individual members are encouraged to spend time in daily devotions and study.

Our exploratory study was designed to establish methods by which to identify Black SDA members for recruitment to the study, and to characterize their health, dietary, and spiritual habits. After meeting with the president of the Lake Region Pastor's Council and the Lake Region pastors, and establishing an advisory board, we identified a church in a lower socioeconomic area on the west side of Chicago, and one in a middle-class area on the south side of Chicago. The purpose of the study was explained to each congregation by the study team at a Sabbath service, and

Table 3. Spiritual health demographics and habits

	Mean (SD)	Median	Range
Age (in years) at baptism	26.2 (14.9)	23	8–64
Years as church member	34.5 (17.1)	36	2–83
Number of church services attended during the past year	50.8 (15.2)	52	2–83

	Grandparents or Earlier	Parents	Respondent
First generation of Seventh-day Adventist Church membership (in percent)	28	28	46

	Frequency				
Variable (in percent)	**Once a day or More**	**2–6 Times Each Week**	**Once a Week**	**Less Than Once a Week**	**Rarely or Never**
Private prayer	95.1	3.7	1.2		
Bible reading	58.5	35.4	3.7	1.2	1.2
E.G. White's reading	24.7	18.5	22.2	8.6	25.9
	Every Week	**2–3 Times Each Month**	**Once a Month**	**Less Than Once a Month**	**Rarely or Never**
Prayer meetings (percent)	26.8	20.7	9.8	7.3	35.4

each local pastor emphasized the importance of the study. We learned that the most effective mechanism for identifying Black SDA church members for study was to review the church register, and then update membership and contact information with the church secretary. At the church on the west side of Chicago, there were no refusals for participation in the study; however, 18% of eligible members had incomplete contact information. When we redoubled our efforts to locate these members, we found that about 40% of these were no longer church members. Based on the socioeconomic status of these members, we were not surprised that the contact information was incomplete. This lack of information emphasizes the need for church staff to form close relationships with members in order to maintain updated contact information for some members, and to possibly identify some members for study by direct, in-person contact at the member's home. Of the congregants we approached at the other church, 2 refused, 12 did not return our telephone calls, and 2 had incomplete or inaccurate telephone information.

In the case of both churches, we were encouraged by the participation response rate, especially after considering the paucity of pre-study publicity for this exploratory study, due to limited funds. Had we developed a substantial pre-study publicity campaign, such as monthly postings in the church bulletin, multiple visits to the churches on the Sabbath by the study team, and a letter writing campaign, we anticipate that the participation rates would have been quite high. Church leaders and members have shown significant enthusiasm for the study based on the need to understand health disparities experienced by the African-American community, as compared to the rest of the US population, the importance of studying the effects of the SDA lifestyle and spiritual adherence for Blacks, and the need for parallel health information garnered previously from White SDAs.

Our exploratory study population was largely one of middle-aged women, with approximately 39% of these being older than 59 years. Results of the study must be interpreted with caution due to the small sample size, and to the fact that the sample may not be representative of the Black SDA community at large. This highlights the need for a larger, more representative study comparing the Black SDA community to the entire African-American community in the United States.

According to the US Department of Agriculture, 55% of African Americans are overweight or obese; 60%–74% rarely exercise; fewer than 50% eat the minimum daily recommendation for grains; 76% do not meet minimum daily recommendations for fruit intake; and fewer than 50% do not meet the daily minimum of recommended servings for vegetables.[11] In the United States, African Americans have a high prevalence of both hypertension (33%) and non-insulin dependent diabetes mellitus (11%).[12,13] In a recent large epidemiologic study,[14] 65% of African Americans reported being current smokers, and 46% reported drinking alcoholic beverages, while in our sample, only 3.5% were current smokers, and 12.8% consumed alcoholic beverages. Ninety-three percent reported eating beef (44.9% in our sample), 73% ate pork products (2.6% in our sample), and 94% consumed caffeinated beverages (31.9% in our sample). These data highlight the differences in diet and lifestyle in the Black SDA community, when compared with the Black community at large.

Our sample members showed a propensity for healthy lifestyle and spiritual practices, but still had a high prevalence of cardiovascular disease risk factors. Although our study information is limited by its self-reported nature, without medical record or other validation, and since our study group represents relatively small numbers of select Black SDA members, the cardiovascular risk factor profile could portend high rates of stroke, coronary heart disease, and

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dementia in this group.[5,10] A study of Black SDA members from a West African seminary demonstrated that a vegetarian diet and African natural diet are associated with lower levels of important cardiovascular risk factors.[15] Study of Black SDA members from churches of several cities in the Northeastern United States show that strict vegetarians (vegans) have a more favorable serum lipid profile compared to lacto-ovo vegetarians.[16] However, there were no diet or gender differences related to blood pressure. In another study of Blacks living in a household containing at least one SDA member, a lifestyle and dietary questionnaire showed that cardiovascular disease factors such as diabetes mellitus, obesity, and hypertension were associated with mortality, whereas frequent consumption of nuts, fruits, and green salads were protective.[17]

Blacks have a disproportionately higher mortality risk compared to Whites in the United States.[5] Black SDA members represent an important group to study when determining African-American prevalence rates for major morbidities and mortalities, and the influence of lifestyle, spiritual, conventional, and non-conventional cardiovascular risk factors, genetic and genetic-environmental interactions on the determination of these outcomes.

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REFERENCES

1. Kant AK, Schatzkin A, Graubard BI, Schairer C. A prospective study of diet quality and mortality in women. *JAMA.* 2000;283:2109–2115.
2. Lee IM, Paffenbarger RS Jr. Associations of light, moderate, and vigorous intensity physical activity with longevity. The Harvard Alumni Health Study. *Am J Epidemiol.* 2000; 151:293–299.
3. Renaud S, Gueguen R. The French paradox and wine drinking. In: Chadwick DJ, Goode JA, eds. *Alcohol and Cardiovascular Disease.* Chichester: Wiley & Sons; 1998:208–223.
4. Gorelick PB, Sacco RL, Smith DB, et al. Prevention of a first stroke: a review of guidelines and a multidisciplinary consensus statement from the National Stroke Association. *JAMA.* 1999;281:1112–1120.
5. Gorelick PB. Cerebrovascular disease in African Americans. *Stroke.* 1998;29:2656–2664.
6. Oman D, Reed D. Religion and mortality among the community-dwelling elderly. *Am J Public Health.* 1998;88:1469–1475.
7. Fraser GE, Strahan TM, Sabate J, Beeson WL, Kissinger D. Effects of traditional coronary risk factors on rates of incident coronary events in a low-risk population. The Adventist Health Study. *Circulation.* 1992;86: 406–413.
8. Gorelick PB, Leurgans S, Richardson D, Harris Y, Billingsley M, and the AAASPS Investigators. African-American Antiplatelet Stroke Prevention Study: clinical trial design. *J Stroke Cerebrovasc Dis.* 1998;7:426–434.
9. Gorelick PB, Freels S, Harris Y, et al. Epidemiology of vascular and Alzheimer's dementia among African Americans in Chicago, Illinois. *Neurology.* 1994;44:1391–1396.
10. Gorelick PB, Erkinjuntti T, Hofman A, Rocca WA, Skoog I, Winblad B. Prevention of vascular dementia. *Alzheimer Dis Assoc Disord.* 1999;13(suppl 3):S131–S139.
11. Harris E, Bronner Y. *2001 Food Counts in the African-American Community: Chartbook 2001.* Baltimore, Md: Morgan State University.
12. Cooper R, Rotimi C, Ataman S, McGee D, Osotimehin B, et al. The prevalence of hypertension in seven populations of West African origin. *Am J Public Health.* 1997;87: 160–168.
13. Cooper RS, Rotimi CN, Kaufman JS, et al. Prevalence of NIDDM among populations of the African diaspora. *Diabetes Care.* 1997;20: 343–348.
14. US Department of Health and Human Services. National Center for Health Statistics. *Third National Health and Nutrition Examination Survey, 1988–1994, NHANES III Household Adult Data File* [CD-ROM]. Hyattsville, Md: Centers for Disease Control and Prevention; 1996. Public Use Data File Documentation Number 76200.
15. Famodu AA, Osilesi O, Makinde YO, Osunuga OA. Blood pressure and blood lipid levels among vegetarian, semi-vegetarian, and non-vegetarian native Africans. *Clin Biochem.* 1998;31:545–549.
16. Toohey ML, Harris MA, DeWitt W, Foster G, Schmidt WD, Melby CL. Cardiovascular disease risk factors are lower in African-American vegans compared to lacto-ovo-vegetarians. *J Am Coll Nutr.* 1998;17:425–434.
17. Fraser GE, Sumbureru D, Pribis P, Neil RL, Frankson MA. Association among health habits, risk factors, and all-cause mortality in a Black California population. *Epidemiology.* 1997;8:168–174.

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