



Nina Mikhailenko. *Fishermen*. Watercolor, 10" × 14".

Women with strong religious beliefs consume more fruits and vegetables than those with weaker beliefs and behaviors.

The Role of Religiosity in Dietary Beliefs and Behaviors Among Urban African American Women

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The relationship between religiosity and health has been investigated in many studies, with most finding positive associations. However, little is known about the role of religiosity in dietary factors, particularly among African American women. We used a self-administered questionnaire to examine the association between religiosity and dietary beliefs and behaviors among African American women. Women with strong religious beliefs and behaviors reported more interest in eating more fruits and vegetables, perceived their consumption as being more important, and consumed more fruits and vegetables than women low in religious beliefs and behaviors. These findings highlight the role of both religious beliefs and behaviors as they relate to diet-related beliefs and behaviors in this population.

Introduction

The association between religiosity/spirituality and health has become the focus of recent interest in both lay and research communities. Religious involvement plays an important role in the lives of many African Americans.¹ African Americans, especially older women, are generally more religiously involved than other groups.^{2,6} Further, as

Lincoln and Mamiya⁷ note, “much of black culture was forged in the heart of black religion and the Black Church.” Given the institutional primacy of the Church in African Americans’ lives, the relationship between religiosity and health is particularly salient for this population. Indeed, the church has been used as a venue for the delivery of health information and services in the African American community.

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The present study uses the term *religiosity* rather than *spirituality*, except when summarizing the work of others who use the term *spirituality*. Religiosity refers to “an organized system of beliefs, practices, rituals, and symbols,” while spirituality refers to “one’s transcendent relationship to some form of higher power.”⁸ The present study examines religious beliefs (eg, personal relationship with God) and behaviors (eg, service attendance), which were highly endorsed in this community sample.

The purpose of the present study was to examine the belief and behavioral dimensions of religiosity and their association with fruit and vegetable consumption and pre-behavioral variables such as self-efficacy, perceived barriers, and importance of/interest in increasing consumption. Previous research suggests that religiosity has a positive association with health-related behaviors, through one or several mechanisms. One would expect that this should be the case for dietary behaviors as well. Because previous studies have not examined these dietary pre-behavioral variables and consumption within the context of this type of religiosity model, or among African American women, additional a priori hypotheses were not delineated.

Religiosity and Health

Most studies suggest a salutary effect of religiosity on health.⁹ Research suggests an association between religiosity and avoidance of alcohol and drugs,¹⁰ lower rates of cancer,¹¹ use of Pap smear tests,¹² and other health-related behaviors, a comprehensive review of which is beyond the scope of this investigation. It is proposed that religion and culture have an effect on diet, such that religions may prescribe or proscribe particular dietary behaviors.¹³ However, few studies have actually empirically examined the associations between religiosity and dietary behaviors, particularly among African Americans, a group disproportionately impacted by diet-related disease.

Existing theory on the religiosity-health relationship proposes several mechanisms through which religiosity may affect health. Church is proposed to benefit health through advocating a healthy lifestyle,¹⁴⁻¹⁶ sanctions against negative health-related behaviors,¹⁷ social support,¹⁴ the experience of positive affect,¹⁶ and positive self-perceptions.¹⁸

Early religiosity studies typically measured church attendance and/or denominational affiliation. Later researchers cited the need for more comprehensive measures of religiosity, leading to the emergence of a multidimensional construct.^{19,20} One model specific to African Americans includes organizational (eg, attending services), nonorganizational (eg, reading religious materials, prayer), and subjective (eg, perceived religiousness) components.¹⁹ However, the belief component is not prominent, and there is considerable conceptual variability in

the non-organizational dimension (eg, consumption of religious media vs prayer).

Building on the strengths of multidimensional models used by previous researchers, the present study employs a two-dimensional model based on religious beliefs and behaviors. The belief dimension is characterized by a religious world-view (eg, close relationship with God, feeling the presence of God in one’s life), while the behavioral dimension is characterized by observable behaviors (eg, service attendance, reading religious materials). This model has demonstrated factorial validity among African American women, and these two dimensions have been associated with breast cancer beliefs and mammography utilization.²¹

Methods

Participants

Participants were recruited by African American women research assistants, from 10 public health centers in St. Louis, Missouri. Criteria for participation included age between 18 and 65 years, ability to read material written at the fifth-grade level, and daily access to a working telephone (for follow-up telephone interviews used in the larger study). Because women 40 years of age and older could receive a mammography intervention as part of the larger study,²² those who had been diagnosed with breast cancer were not eligible to participate.

A total of 1,227 women were recruited. This convenience sample of volunteers ranged in age from 18 to 65 years, with a mean age of 35.57 years (SD = 11.56). The mean years of education was 12.26 (SD = 1.85) and ranged from 2 to 20 years. Within this sample, 756 women (61.6%) were single, 202 (16.5%) were married, 185 (15.1%) were separated or divorced, 44 (3.6%) were widowed, and 40 women (3.3%) were missing data. Regarding employment status, 558 (45.5%) worked full time, 191 (15.6%) worked part time, 456 (37.2%) were not employed at the time of enrollment, and 22 (1.8%) were missing data. The median household income before taxes was in the \$10,001–\$20,000 bracket, ranging from less than \$5,000 to more than \$60,000 per year (1.5% in this highest bracket). Most (n = 911; 74.2%) reported belonging to a Christian religion (eg, Baptist, Methodist), though 145 (11.8%) reported not belonging to a religious group, 11 (0.9%) were Muslims, 21 (1.7%) were Jehovah’s Witnesses (also a Christian religion), 115 (9.4%) reported another (unspecified) affiliation, and 24 (2.0%) were missing data. An advisory panel of African American women who work at the health centers was convened for the larger study and deemed these categories of religious affiliation to be the most common in this population.

Measures

Religiosity: The development and validation of the religiosity scale is discussed in detail elsewhere.²³ Religiosity

beliefs²¹ (eg, “I am often aware of the presence of God in my life.”) and behaviors²¹ (eg, “About how many times a month do you usually attend religious services?”) were assessed in 4-point Likert-type format (strongly agree...strongly disagree), except for religious attendance (0, 1–3, or 4+ times per month). The original 9-item scale had high internal consistency ($\alpha = .88$) and temporal stability over a 2-week period ($r = .89, P < .001$). These two dimensions were used to classify participants into four religious orientations. For example, if a participant’s belief score was above the median and her behavior score was below, she was classified as belief-only (Figure 1).

Barriers to Eating Fruits and Vegetables: Barriers (eg, too expensive, too much trouble to prepare) were assessed with 4-point Likert-type items (strongly agree...strongly disagree; temporal stability ranged from $r = .31$ to $.48, P < .05$).

Knowledge of Optimal Number of Daily Servings: This scale was assessed with a single item (1, 2, 3, 4, 5, 6 or more servings; temporal stability: $r = .61, P < .001$).

Self-Efficacy for Eating Fruits and Vegetables: This was assessed with a single item (very, somewhat, not at all confident; temporal stability: $r = .50, P < .001$).

Importance of and Interest in Eating Fruits and Vegetables: This was assessed with four items, using 4-point Likert-type format (very, somewhat, not very, and not at all important).

Fruit and Vegetable Consumption: This category was assessed based on the Five A Day survey developed by the National Cancer Institute. Seven items assessed fruit consumption (1 piece of fresh fruit, 6 ounces of fruit juice), and six items assessed vegetable consumption (1 cup of raw vegetables, 1/2 cup of cooked vegetables). Responses ranged from 0 to 8 or more times per week. Responses to these fruit and vegetable food frequency items were separately summed to form an index each of weekly fruit and vegetable consumption. These totals were then divided by 7 to yield the daily fruit and daily vegetable consumption. Participants who responded to less than 70% of individual fruit and vegetable items received a missing value for the corresponding index scores. Servings of French fries were not included in the daily servings of vegetables calculation.

Procedure

Participants were recruited in the waiting rooms of 10 urban public health centers. If they met the eligibility criteria and gave their informed consent to participate, they completed the baseline questionnaire. This activity took 15 to 30 minutes to complete, and participants were mailed a \$20.00 check for their participation.

Analyses

To determine whether the different religious orientations (belief only, behavior only, low religious, high religious) differed in the aforementioned dietary beliefs and behaviors,

multivariate analyses of variance (MANOVA) were conducted, and the univariate analyses and Scheffé pair-wise comparisons were examined where appropriate. Education and income were examined as potential covariates but were not included in the models because they were not significantly associated with religious orientation.

Results

Religious Orientations

In general, this was a highly religious sample, as scores on the belief dimension ranged from 4 to 16 (of a possible 4–16 range), with a mean of 14.39 (SD = 1.97), and scores on the behavioral dimension ranged from 5 to 18 (out of a possible 5–18 range), with a mean of 13.32 (SD = 2.79). Using the classification schema described previously, 11.5% ($n = 141$) were behavior only, 11.8% ($n = 145$) were belief only, 31.9% ($n = 392$) were high religious, and 36.5% ($n = 448$) were low religious. The other cases were missing data.

Fruit and Vegetable Barriers, Knowledge, and Self-Efficacy

For fruit and vegetable barriers, knowledge, and self-efficacy, the multivariate effect was significant (Wilks’ lambda $F [18, 2896.80] = 2.55, P < .001$) (Table 1). Univariate analyses revealed that the religious orientation effect was significant for fruits and vegetables are too much trouble to prepare ($P < .01$) and self-efficacy for eating more fruits and vegetables ($P < .01$). Those classified as low religious cited preparation as a barrier significantly more than did those high in belief only, and participants high on behaviors only cited it more than did those in the belief-only group ($ps < .05$). Those classified as high religious reported significantly more self-efficacy for eating more fruits and vegetables than did women low on both dimensions of religiosity ($P < .01$). The other univariate analyses were nonsignificant.

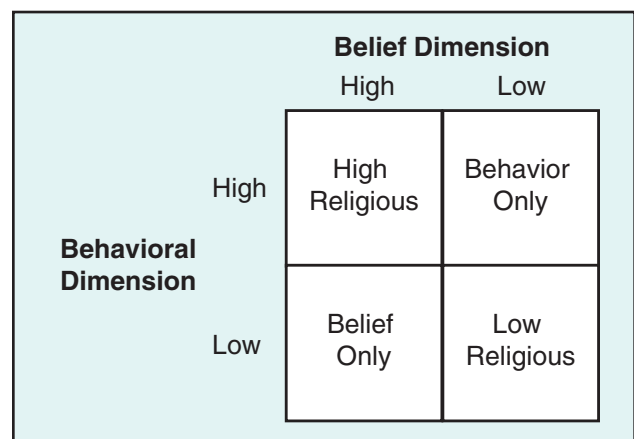


Fig 1. — Religious orientations. From Holt CL, Lukwago SN, Kreuter MW. Spirituality, breast cancer beliefs and mammography utilization among urban African American women. *J Health Psychol.* 2003;8:383-396. Reprinted with permission from Sage Publications Ltd.

Table 1. — Analysis of Variance Cell Means for Fruit and Vegetable Knowledge, Self-Efficacy, and Barriers

| Dependent Variable | df | F | Religious Orientation | | | |
|--|----|-------|-----------------------------|-------------------------------|-------------------------------|-------------------------------|
| | | | Low Religious | Behavior Only | Belief Only | High Religious |
| Knowledge of optimal daily servings | 3 | 1.56 | 3.52 _a (1.28) | 3.46 _a (1.36) | 3.68 _a (1.34) | 3.68 _a (1.29) |
| Self-efficacy for eating more fruits and vegetables | 3 | 5.14* | 2.65 _a (.46) | 2.76 _{a, b} (.53) | 2.73 _{a, b} (.45) | 2.78 _b (.48) |
| Barriers: | | | | | | |
| Fruits and vegetables are too expensive | 3 | 1.92 | 2.22 _a (.79) | 2.31 _a (.84) | 2.28 _a (.86) | 2.37 _a (.94) |
| Nutrition information is confusing | 3 | 1.08 | 2.22 _a (.74) | 2.37 _a (.84) | 2.24 _a (.86) | 2.28 _a (.88) |
| Too much trouble to prepare fruits and vegetables | 3 | 4.64* | 1.86 _a (.60) | 1.94 _a (.66) | 1.65 _b (.61) | 1.83 _{a, b} (.76) |
| Fruits and vegetables at my grocery store are poor quality | 3 | 0.70 | 2.13 _a (.72) | 2.15 _a (.72) | 2.03 _a (.86) | 2.13 _a (.86) |

* $P < .01$.
Values in parentheses represent standard deviations. Items that do not share subscripts differ at the $P < .05$ level of significance.

Interest in and Importance of Dietary Change

For perceived importance of and interest in eating more fruits and vegetables, the multivariate effect was significant (Wilks' lambda $F [12, 2730.71] = 3.20, P < .001$) (Table 2). The religious orientation effect was significant for all four dependent variables ($ps < .01$). Those classified as high religious thought it was more important and had more interest in eating more fruits and vegetables than those who were low religious ($ps < .01$). For importance of eating more vegetables, those classified as high religious reported more importance than the belief-only group ($P < .05$). For interest in eating more vegetables, those in the behavior-only group were significantly higher than those in the low-religious group ($P < .05$).

Fruit and Vegetable Consumption

For fruit and vegetable consumption, the multivariate effect was significant (Wilks' lambda $F [6, 2026] = 8.30, P < .001$) (Table 3). The religious orientation effect was

significant for fruit as well as vegetable consumption ($ps < .001$). For both fruit and vegetable consumption, those in the high-religious group ate significantly more servings per day than those in the low-religious group ($ps < .001$). For daily servings of fruit, those classified as belief-only as well as behavior-only ate more than the low-religious group ($ps < .01$).

Discussion

Overall, the current findings are consistent with the positive association between religiosity and health-related beliefs and behaviors in this population.^{9,21,24} Women who engaged in religious behaviors and held strong religious beliefs consumed more fruits and vegetables than those who were low on these dimensions. In addition, women high in beliefs only as well as those high in behaviors only consumed more fruit than those low on both of these

Table 2. — Analysis of Variance Cell Means for Importance of and Interest in Eating More Fruits and Vegetables

| Dependent Variable | df | F | Religious Orientation | | | |
|--------------------------------------|----|-------|----------------------------|----------------------------------|----------------------------------|-------------------------------|
| | | | Low Religious | Behavior Only | Belief Only | High Religious |
| Importance of eating more fruit | 3 | 5.37* | 3.63 _a (.59) | 3.73 _{a, b} (.53) | 3.68 _{a, b} (.56) | 3.78 _b (.47) |
| Interest in eating more fruit | 3 | 6.47* | 3.63 _a (.59) | 3.75 _{a, b} (.52) | 3.71 _{a, b} (.50) | 3.79 _b (.46) |
| Importance of eating more vegetables | 3 | 6.84* | 3.72 _a (.52) | 3.81 _{a, b, c} (.48) | 3.71 _{a, b} (.52) | 3.86 _c (.42) |
| Interest in eating more vegetables | 3 | 9.64* | 3.63 _a (.57) | 3.80 _{b, c} (.49) | 3.68 _{a, b, c} (.53) | 3.82 _{b, c} (.46) |

* $P < .001$.
Values in parentheses represent standard deviations. Items that do not share subscripts differ at the $P < .05$ level of significance.

Table 3. — Analysis of Variance Cell Means for Daily Fruit and Vegetable Consumption

| Dependent Variable | df | F | Religious Orientation | | | |
|---|----|--------|-----------------------------|-----------------------------------|-----------------------------------|-----------------------------------|
| | | | Low Religious | Behavior Only | Belief Only | High Religious |
| Fruit consumption: servings per day | 3 | 14.71* | 1.65 _a (1.05) | 2.19 _{b, c} (1.36) | 2.10 _{a, b, c} (1.53) | 2.24 _{b, c} (1.45) |
| Vegetable consumption: servings per day | 3 | 9.82* | 1.56 _a (.90) | 1.83 _{b, c, d} (1.12) | 1.78 _{b, c, d} (1.07) | 1.95 _{b, c, d} (1.07) |

* $P < .001$.
 Values enclosed in parentheses represent standard deviations. Items that do not share subscripts differ at the $P < .05$ level of significance.

dimensions. This suggests the importance of each religious dimension, particularly as associated with fruit consumption. These findings extend our knowledge of the religion-diet relationship, which until recently has been relatively unexplored. There appear to be synergies achieved when both the behavioral and belief dimensions of religiosity are present in a given individual. People in church may have more instrumental support²⁵ involved with food shopping and preparation than those not involved with a religious group. A related study did not find associations between fruit and vegetable consumption and intrinsic or extrinsic religious orientation.²⁶ However, the study was composed of a largely white female sample from the Pacific Northwest, which may account for the discrepant findings. The study did report a positive association between extrinsic religiosity and low-fat dietary behaviors.

Ferraro²⁷ reported that obesity is correlated with religious practice among Americans (oversampling African Americans). It may be that religious Americans (including African Americans) are eating more fruits and vegetables, but they also have higher total caloric intake, resulting in the higher body weight. These findings may also relate to African American cultural traditions of having meals at church that include foods such as fried chicken, macaroni and cheese, greens prepared in pork fat, and sweet potatoes. It is possible that women involved in church are eating more fruits and vegetables because they are eating more meals with others. Others report that eating alone is associated with having a poor diet.²⁸

Women in the high-religious group also expressed more self-efficacy for eating more fruits and vegetables than women low in religiosity. They also expressed more interest in and importance of eating more fruits and vegetables than did their low-religious counterparts. In addition, women in the behavior-only group reported more interest in eating more vegetables than those low on both dimensions. These findings may point to the social milieu of church attendance and other religious behaviors as more important for this type of dietary belief than only holding religious beliefs (though it is clear that both are important). To the extent to which church participation reflects a kind of social connectedness,²⁹ these findings

suggest that women who are more connected think eating more fruits and vegetables is important, and they are highly interested in eating more fruits and vegetables. Future research should examine the role of social connectedness. The most consistent finding is that women low in religiosity (both dimensions) scored lowest in these adaptive dietary beliefs and behaviors.

Curiously, the behavior-only group cited preparation as a barrier to eating more fruits and vegetables, more than did those high in beliefs only. This finding was not predicted by previous research and is inconsistent with the other findings. These women may be more susceptible to a socially desirable response pattern, in which they were less likely to endorse the idea that fruits and vegetables are too much trouble to prepare. This may be the item most susceptible to this type of bias, which may be why the pattern appeared only with this variable. Because our study did not include a social desirability measure, this speculation cannot be confirmed with the present data.

Limitations

The results of the present study must be interpreted within the context of several limitations. First, this was a cross-sectional, convenience sample of lower-income urban Midwestern African American women. A different pattern of results may have emerged had the sample been rural, older, or of a different region or socioeconomic status. The sample contained only women, as it was drawn from a larger study examining the effects of a health education intervention on mammography screening. It would be important to replicate the study in other populations, such as African American men, and those of other racial/ethnic groups. Others have examined African American men and found that not attending church was associated with increased nutritional risk.³⁰ Second, a self-selection bias may be operating, whereby religiosity may draw a population more likely to adhere to healthy lifestyles. Thus, it may be that people with healthy lifestyles are drawn to attend church and are religious, rather than the religious lifestyle exerting positive influences upon their health. No causal conclusions may be drawn from the present data. Third, self-report may yield recall biases in dietary and other measures. However, because all participants

completed the same assessments, any bias would have been systematic across participants regardless of their level of religiosity. Finally, a social desirability bias may be operating, which may have influenced diet-related reporting. It is unknown whether or not this is associated with religiosity and would be a confounding variable, because this was not assessed in this study. However, other studies report that modest or weak associations between religiosity and social desirability³¹ or that social desirability has little impact on the association between religiosity and the dependent variable of interest.³²

Recommended Next Steps/Application of Findings

Future research should explore not only the relationships between religiosity and health, but also the mechanisms through which religiosity may impact health. Mechanisms proposed thus far include church advocating of a healthy lifestyle,¹⁴⁻¹⁶ sanctions against negative health-related behaviors,¹⁷ social support,^{14,25} the experience of positive affect,¹⁶ and positive perceptions of self.¹⁸ Mechanisms that may be most promising as to mediating the relationship between religiosity and diet may include coping with stress, positive affect, and church advocacy of a healthy lifestyle.³³ These mechanisms may help explain the positive association between several factors: religious beliefs/behaviors, fruit and vegetable consumption, and prebehavioral variables. These relationships could be examined through the use of longitudinal designs or retrospective data collection and aided by more sophisticated data analysis techniques such as structural equation modeling. These mechanisms could also be explored through qualitative interviews. The further development of measures of religious beliefs and behaviors is also warranted, as well as the exploration of spirituality.

The present findings suggest an association between religiosity and dietary beliefs/behaviors, making the church an attractive venue for further dietary intervention. A church-based dietary educational intervention approach may be viable, particularly if dietary patterns are already linked with this social institution in the African American community. This type of intervention has been successful for increasing fruit and vegetable consumption among rural African American church members.³⁴ Although women in this population who attend church and hold strong religious beliefs are eating more fruits and vegetables than those who do not, the means for these women still fall nearly one serving below the recommended minimum of five servings per day, and far below the United States Department of Agriculture recommendation to eat five to nine servings per day.³⁵ A previous study found that older African Americans in St. Louis had low fruit and vegetable consumption and had difficulty shopping for and preparing food for themselves.³⁶ Because of the finding that people in church tend to be overweight,²⁷ interventions should target healthier eating and preparation of fruits and vegetables, as well as por-

tion control. Individuals of lower socioeconomic position may have a more difficult time having the resources necessary to obtain fruits and vegetables or having access (eg, transportation to stores that sell fresh, quality produce) to do so. In addition, individuals low in health literacy may lack understanding of the health benefits of fruit and vegetable consumption. Thus, low socioeconomic position and low literacy and/or health literacy may put an individual at risk for adverse health outcomes of low fruit and vegetable consumption.

The church is an effective venue for health education because it is central to and trusted in the African American community. It is an appropriate place to provide health education to underserved or rural populations or to those who may not have access to or may not trust the medical community. These educational efforts should not only utilize the church as a venue, but also address the religious beliefs of the target population. For example, educational materials that put healthy eating within the context of one's religiosity may be more effective than secular health content provided in the church setting. Given both the centrality of the church to the African American community and the health disparities affecting this population, any opportunity to capitalize on positive dietary patterns may be promising. However, the present findings also suggest that in this population, the women who may be most in need of intervention are those who are not religiously involved. Women in the greatest need of health education may be those not found in churches, health centers, schools, and society's other traditional mediating structures. If this is the case, real progress on eliminating health disparities may require new strategies and settings.

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References

1. Taylor RJ, Chatters LM. Church-based informal support among elderly blacks. *Gerontologist*. 1986;26:637-642.
2. Levin JS, Taylor RJ. Gender and age differences in religiosity among black Americans. *Gerontologist*. 1993;33:16-23.
3. Ferraro KF, Koch JR. Religion and health among black and white adults: examining social support and consolation. *J Sci Study Relig*. 1994;33:362-375.
4. Levin JS, Taylor RJ, Chatters LM. Race and gender differences in religiosity among older adults: findings from four national surveys. *J Gerontol*. 1994;49:S137-S145.
5. Levin JS, Taylor RJ. Age differences in patterns and correlates of the frequency of prayer. *Gerontologist*. 1997;37:75-88.
6. Chatters LM, Taylor RJ, Lincoln KD. African American religious participation: a multi-sample comparison. *J Sci Study Relig*. 1999;38:132-145.
7. Lincoln CE, Mamiya LH. The black church in the African American experience. Durham, NC: Duke University Press; 1990.
8. Thoresen CE. Spirituality, health, and science: the coming revival? In: Roth-Roemer S, Robinson Kurpius SE, eds. *The Emerging Role of Counseling Psychology in Health Care*. Chicago, Ill: W.W. Norton; 1998:409-431.
9. Koenig HG. Religion and medicine IV: religion, physical health, and clinical implications. *Int J Psychiatry Med*. 2001;31:321-336.
10. Payne IR, Bergin AE, Bielema KA, et al. Review of religion and mental health: prevention and the enhancement of psychosocial functioning. *Prev Hum Serv*. 1991;9:11-40.

11. Levin JS, Vanderpool HY. Religious factors in physical health and the prevention of illness. *Prev Hum Services*. 1991;9:41-64.
12. Naguib SM, Geiser PB, Comstock GW. Response to a program of screening for cervical cancer. *Public Health Rep*. December 1968;83:990-998.
13. Shatenstein B, Ghadirian P. Influences on diet, health behaviours and their outcome in select ethnocultural and religious groups. *Nutrition*. 1998;14:223-230.
14. Musick MA, Traphagan JW, Koenig HG, Larson DB. Spirituality in physical health and aging. *J Adult Dev*. 2000;7:73-86.
15. George LK, Larson DB, Koenig HG, et al. Spirituality and health: what we know, what we need to know. *J Soc Clin Psychol*. 2000;19:102-116.
16. Strawbridge WJ, Shema SJ, Cohen RD, et al. Religious attendance increases survival by improving and maintaining good health behaviors, mental health, and social relationships. *Ann Behav Med*. 2001;23:68-74.
17. Grasmick HG, Bursik RJ, Cochran JK. Render unto Caesar what is Caesar's: religiosity and taxpayers' inclinations to cheat. *Sociol Q*. 1991;32:251-266.
18. Ellison CG. Religious involvement and self-perception among black Americans. *Soc Forces*. 1993;71:1027-1055.
19. Chatters LM, Taylor RJ, Lincoln KD. Advances in the measurement of religiosity among older African Americans: implications for health and mental health researchers. *J Ment Health Aging*. 2001;7:181-200.
20. Hill PC, Hood RW Jr, eds. *Measures of Religiosity*. Birmingham, Ala: Religious Education Press; 1999.
21. Holt CL, Lukwago SN, Kreuter MW. Spirituality, breast cancer beliefs and mammography utilization among urban African American women. *J Health Psychol*. 2003;8:383-396.
22. Kreuter MW, Skinner CS, Haire-Joshu D, et al. *Cultural Tailoring for Cancer Prevention in Black Women*. St Louis, Mo: Health Communication Research Laboratory, National Cancer Institute Funded Grant #CA 81872; 1998.
23. Lukwago SL, Kreuter MW, Bucholtz DC, et al. Development and validation of brief scales to measure collectivism, religiosity, racial pride, and time orientation in urban African American women. *Fam Community Health*. 2001;24:63-71.
24. Brown DR, Gary LE. Religious involvement and health status among African-American males. *J Natl Med Assoc*. 1994;86:825-831.
25. Caldwell CG, Greene AD, Billingsley A. The black church as a family support system: instrumental and expressive functions. *Natl J Sociol*. 1992;6:421-440.
26. Hart A Jr, Tinker LF, Bowen DJ, et al. Is religious orientation associated with fat and fruit/vegetable intake? *J Am Diet Assoc*. 2004;104:1292-1296.
27. Ferraro KF. Firm believers? Religion, body weight, and well-being. *Rev Relig Res*. 1998;39:224-244.
28. Melnik TA, Helferd SJ, Firmery LA, et al. Screening elderly in the community: the relationship between dietary adequacy and nutritional risk. *J Am Diet Assoc*. 1994;94:1425-1427.
29. Taylor RJ. Religion and religious observances. In: Jackson JS, Chatters LM, Taylor RJ, et al, eds. *Aging in Black America*. Thousand Oaks, Calif: Sage Publications; 1993:101-123.
30. Locher JL, Ritchie CS, Roth DL, et al. Social isolation, support, and capital and nutritional risk in an older sample: ethnic and gender differences. *Soc Sci Med*. 2005;60:747-761.
31. Sherman AC, Plante TG, Simonton S, et al. Assessing religious faith in medical patients: cross-validation of the Santa Clara Strength of Religious Faith Questionnaire. *Pastoral Psychology*. 1999;48:129-141.
32. Hansen DE, Vandenberg B, Patterson ML. The effects of religious orientation on spontaneous and nonspontaneous helping behaviors. *Pers Individ Dif*. 1995;19:101-104.
33. Holt CL, Lewellyn LA, Rathweg MJ. Exploring religion-health mediators among African American parishioners. *J Health Psychol*. 2005;10:511-527.
34. Campbell MK, Bernhardt JM, Waldmiller M, et al. Varying the message source in computer-tailored nutrition education. *Patient Educ Counsel*. 1999;36:157-169.
35. US Dept of Agriculture, Human Nutrition Information Service. Food guide pyramid: a guide to daily food choices. Washington, DC: Home and Garden Bulletin No. 252; 1992.
36. Miller DK, Carter ME, Sigmund RH, et al. Nutritional risk in inner-city-dwelling older black Americans. *J Am Geriatr Soc*. 1996;44:959-962.