# The impact of religiosity on dietary habits and physical activity in minority women participating in the Health is Power (HIP) study

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A B S T R A C T

African American (AA) and Hispanic/Latina (HL) women report lower rates of physical activity (PA) and poorer dietary habits compared to their white counterparts. Religiosity can act as a protective factor for health; however, the relationship between religiosity, PA, and diet is unclear. This study aimed to investigate the influence of religiosity on PA and fruit and vegetable (FV) and fat consumption in minority women. Health is Power (HIP) was a 6-month intervention where participants (AA: 63%; HL: 37%) were randomized to a PA or FV group. Questionnaires assessed religiosity at baseline and PA, FV and fat consumption at baseline and post-intervention. Hierarchical linear regression models were used to investigate religiosity as a predictor of change in PA, FV and fat, while controlling for demographics. AA women had significantly higher religiosity scores (M = 44.15, SD = 10.66) compared to H/L women (M = 35.11, SD = 12.82; $t(251) = 5.86$, $p < 0.001$). Across both groups, PA increased by 15%, FV intake increased by 27%, and consumption of calories by fat decreased by 5%. Religiosity was not a significant predictor of PA or diet ($p < 0.05$). The results of this study found no association between religiosity and change in PA and diet. More longitudinal studies are needed to explore the role of religiosity in the health of minority women.

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## 1. Introduction

It is well-established that the combination of lack of physical activity and poor dietary habits increases the risk of obesity and related diseases (Lee et al., 2011a). Physical inactivity is particularly prevalent among women and minorities (Lee & Cubbin, 2009). African American (AA) and Hispanic/Latino (HL) women are less likely to meet physical activity (PA) or fruit and vegetable (FV) recommendations compared with whites (Lee et al., 2011a; Lee & Cubbin, 2009; Facts about Physical Activity, 2015).

Religiosity and spirituality (R/S) has been shown to positively affect health (Koenig, 2012; Tan et al., 2013). R/S may impact health through individual implementation of health-promoting religious acts and beliefs, religious prohibitions against unhealthy behaviors, and other religious laws (Tan et al., 2013; Hart et al., 2006). R/S may also impact health as a R/S community can provide supportive social connections that can reinforce behaviors, increase community trust and involvement, and potentially allow for the flow of health information (Koenig, 2012; Gillum, 2006; Underwood, 2006). R/S has been positively associated with well-being, self-esteem, reduced risk of all-cause mortality, and lower rates of lifestyle-related diseases such as hypertension, cardiovascular disease, and cancer (Koenig, 2012; Tan et al., 2013). Of the few studies that have examined this relationship, some found that R/S was associated with more PA and a healthier diet, while other studies found no relationship (Gillum, 2006). Longitudinal studies are needed to explore the relationship between R/S and improvement in PA and dietary habits, particularly in minority women (Lee et al., 2011a; Lee & Cubbin, 2009; Mama et al., 2014; Lee et al., 2011b; 2012).

The majority of previous studies have been cross-sectional, do not investigate whether those with more R/S who participate in behavioral interventions have greater success at behavior change, and typically do not include ethnic minority women. Many studies have relied on measures that have not demonstrated adequate reliability and validity. In addition, some studies do not control for demographic variables, which can also affect the outcome of the relationship being tested (Koenig, 2012; Tan et al., 2013; Hart et al., 2006). Therefore, further research in a longitudinally designed model with standardized measurement tools focused on ethnic minority women is necessary to establish guidelines for behavioral interventions in the future. The purpose of this study was to investigate the influence of spirituality and religious involvement on the adoption of PA and healthful dietary habits

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of ethnic minority women participating in a behaviorally based intervention using a longitudinal design, hypothesizing that there would be a positive association between degree of R/S and the increase in PA and consumption of FV, and decrease in consumption of fat. Improved understanding of these relationships could improve interventions to address the distressing disparities in the health of ethnic minorities.

## 2. Methods

### 2.1. Design and setting

Health is Power (HIP) was a multisite, randomized, controlled trial to increase PA and improve dietary habits in AA and HL women. HIP was implemented in Houston and Austin, Texas from 2006 to 2008. Women were recruited using a variety of strategies including face-to-face announcements at community meetings and events, advertisements in local media (Lee et al., 2016). Participants were randomly assigned to a PA group or vegetable and fruit comparison group. Both intervention groups met six times over a six-month period and were behaviorally based, using group cohesion techniques to foster cohesion, cooperation and friendly competition specific to either PA or vegetable and fruit consumption (Lee et al., 2011a; 2012). All HIP study assessments, measures, and procedures were approved by the Committee for the Protection of Human Subjects at the University of Houston, and participants provided written informed consent to participate (HRP-503a) (Lee et al., 2011b; 2012).

### 2.2. Participants

Recruited women (N = 410; Houston = 311, Austin = 99) self-identified as AA (63%) or HL (37%) were between the ages of 25 and 60 years old, not pregnant or planning to become pregnant within the next 12 months, and apparently healthy. After women were recruited, they completed a run in procedure as described below to avoid assigning women to groups who might be more likely to drop out, resulting in a sample of 310 women assigned to groups. A total of 198 women completed post-intervention measures, representing 64% of those assigned, which compares favorably to other studies of ethnic minority women (Lee et al., 2016). Of these, 132 had complete data on all measures, and these cases were used for analyses.

### 2.3. Individual measures

Women completed measures of PA, FV, and fat intake at the T1 assessment. These women were given a take home packet containing health questionnaires assessing R/S as part of the run-in procedure. The International Physical Activity Questionnaire (IPAQ) long form was used to measure self-reported walking, leisure-time, and total physical activity over the last 7 days. PA was reported as days per week and minutes and/or hours per day and was converted to metabolic equivalent minutes (MET-minutes) (Lee et al., 2011b; 2012). Dietary habits were measured using the National Cancer Institute Fruit and Vegetable Screener and Fat Screener. Fruit and vegetable consumption was reported as frequency and amount consumed each time over the last month. The Fat Screener measures an individual's usual dietary intake of percent calories from fat (Lee et al., 2011b; 2012). R/S was measured using the National Institute of Aging/Fetzer Short Form for the Measurement of Religiousness and Spirituality. This multidimensional tool is brief, measures traditional religiousness and non-institutional spirituality, is appropriate for Judeo Christian populations, and was developed with the specific goal of assessing the association between R/S and health. After 6 months of intervention activities, women returned to complete a post-intervention (T2) assessment 6 months later (Lee et al., 2011b; 2012). The R/S questionnaire was administered at T1 baseline only.

### 2.4. Statistical analysis

Descriptive analyses were performed to describe individual health characteristics. Bivariate correlations were assessed to determine whether there were statistically significant correlations among R/S, PA, FV and fat consumption. Items on the R/S instrument were reverse coded and transformed to a z score before being summed into a continuous variable. Surveys with more than 3 items missing were not included. The minimum to maximum possible score ranged between 19 and 103 (Idler et al., 2003).

In order to determine uniqueness of R/S as a significant predictor for improvement in PA and dietary habits, while controlling for covariates, five linear regression analyses were conducted, one for each of the three PA variables and one for each of the two dietary habits variables with the post-intervention (T2) behavioral measure as the dependent variable. For each model, in the first block, the baseline (T1) behavioral measure was entered. Next in the second block, the potential demographic variables (educational attainment, household income, intervention site, age, and ethnicity) were entered. In the third block, the R/S variable was added. All analyses were performed using IBM statistical software SPSS version 22.0, and a p value of <0.05 was used as the criterion for all statistical testing.

## 3. Results

Of the participants, 132 provided complete data for this study as described above. Most participants (63%) were African American (AA), and 37% identified as Hispanic/Latina (H/L). Women had a mean age of 45; 32% identified as Protestant, 28.6% as Catholic, 9.4% as Jewish, 27% as Another, and 3% as None. Eighty-nine percent had some college education and 49% reported an income 401% or greater above the Federal Poverty Level for a family of four. Women scored an average of 41.6 (SD = 11.3) on R/S. Demographic characteristics of the study sample are presented below in Table 1.

At post-intervention, physical activity levels increased by 15%, FV intake increased by 27% and fat consumption decreased by 5%. Physical activity and dietary habit outcomes pre- and post-intervention are presented in Table 2, below. Bivariate correlations revealed that there were no significant relationships between variables of interest. Linear regression models were unable to identify R/S as a statistically significant and unique predictor of improvement in PA, FV or fat consumption, after adjusting for demographic variables.

## 4. Discussion

The HIP study is among the first to longitudinally investigate how R/S may influence adoption of PA and dietary habits among AA and H/L

**Table 1**
Participant demographic characteristics in the Health is Power study.

| Demographic variable N = 403 | Mean (SD) |
| --- | --- |
| Age | 45.2 (9.35) |
| Houston | 74.6 (304) |
| Austin | 25.4 (99) |
| Ethnicity (%) | |
| African American | 62.7 (252) |
| Hispanic/Latina | 37.3 (149) |
| Religion (%) | |
| Protestant | 32.1 (129) |
| Catholic | 28.6 (115) |
| Jewish | 9.4 (38) |
| Another | 27.4 (110) |
| None | 2.6 (10) |
| Education (%) | |
| Some college or college graduate | 88.7 (346) |
| Greater than 400% over the poverty line | 49.3 (182) |