



Are social relationships a healthy influence on obesogenic behaviors among racially/ethnically diverse and socio-economically disadvantaged residents?

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ABSTRACT

Objective. To examine associations between social support and ties (family, friend, and neighbors) *individually* and *jointly* with diet and physical activity among an ethnically-diverse, low-income population.

Methods. The Health in Common study (2005–2009) was designed to examine risk factors among individuals residing in low-income housing in the Boston, MA area. Cross-sectional surveys (n = 828) were administered in residents' homes. Linear/logistic multivariable analyses were employed with clustering of individuals within housing sites controlled as a random effect.

Results. In multivariable analyses, total social support was significantly associated with higher red meat consumption per day (p = 0.029). Having more friends was significantly associated with more daily fruit and vegetable intake (p = 0.007) and higher levels of daily vigorous physical activity (p = 0.011). Those who reported having a greater number of family ties also reported higher daily consumption of sugary drinks (p = 0.013) and fast food (p = 0.011). More neighbor social ties were associated with more fast food per day (p = 0.024).

Conclusions. Social relationships can have both positive and negative associations with health behaviors. Understanding these relationships could help to inform the design of interventions that promote healthy behavior change among vulnerable populations.

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Background

Racial/ethnic minorities of lower socio-economic status (SES) suffer from a disproportionate burden of disease, in part due to elevated risk factors, such as low rates of physical activity (Centers for Disease Control and Prevention, 2008) and unhealthy dietary patterns (Centers for Disease Control and Prevention, 2009). Lower SES groups also face financial, social, and environmental constraints that can hinder healthy behaviors (Chang et al., 2008; Eikenberry and Smith, 2004; Eyster et al., 2002; McIntyre et al., 2003; Parker and Keim, 2004). Given this, enhancing social relationships has been promoted as a promising strategy to help promote healthy lifestyles (Komar-Samardzija et al., 2012; Silva et al., 2012).

Social relationships greatly influence overall health and well-being (Berkman and Kawachi, 2000; Cassel, 1976; House et al., 1988; Mitchell et al., 1983). Individuals who are more socially isolated and less socially integrated suffer more morbidity and mortality (Berkman

and Syme, 1979; Blazer, 1982; Untas et al., 2011). Research on social networks and ties through which support is provided offers some of the most compelling evidence of the benefits of social relationships. These may deter illness onset indirectly by buffering the harmful effects that chronic stress can have on health outcomes (Cassel, 1976; Cobb, 1976; Uchino et al., 1996) and may also impact health through their direct influence on health behaviors (Kelsey et al., 1996).

Studies that have examined the impact of social network ties and support on health behaviors have yielded inconsistent findings. While some show that social relationships can have a 'positive' impact on obesogenic behaviors (Fuemmeler et al., 2006; Hemmingsson et al., 2008; Langenberg et al., 2000) others have suggested that they may have a 'negative' impact on these and related outcomes (Christakis and Fowler, 2007; Kelsey et al., 1996; Schaffer and Lia-Hoagberg, 1997; Tamers et al., 2011a). This potentially 'negative' impact may be even more pronounced among lower SES groups, given already limited access to health-promoting resources.

Research on the mechanisms by which social relationships impact diet and physical activity among vulnerable groups is particularly limited. While studies have generally shown an association between social relationships and health, there is a need to more clearly understand how relationships influence diet and physical

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activity. This investigation explored associations between social relationships (support and ties) of family, friends, and neighbors *individually* and *jointly* with diet and physical activity among racially/ethnically diverse lower SES individuals.

Methods

Data source

Data from the Health in Common (HIC) study (2005–2009) were analyzed to examine the relationship between social support and ties and dietary and physical activity behaviors. HIC examined cancer risks among residents of low-income housing (N=20) in greater Boston, MA. The HIC study was approved by the Dana-Farber Cancer Institute Institutional Review Board.

Households were randomly selected within housing developments and individuals were randomly selected within households. To recruit participants, an introductory letter was distributed to all households to describe the study objectives and procedures. The field staff endeavored to recruit each randomly selected household on a minimum of eight occasions. The survey staff randomly selected a resident within each multi-adult household using the Kish method (Kish, 1949); residents of single adult households were designated as the participant.

Setting and sample

The purpose of the resident survey was to assess residents' cancer-related health behaviors, and their perceptions of environmental and social conditions in their housing developments. All households were provided with language-appropriate materials. Of the original 1937 residents that had been randomly selected to participate, 1679 were estimated to be eligible and surveys were successfully administered to 828 residents (49% of those eligible).

Measures

Social support and social ties

Seven items assessed availability of social support and social ties (Heaney and Israel, 1997). For social support, residents were asked if they had family, friends or neighbors that they “feel close to, can talk to about private things or can rely on for help, or make you feel loved and cared for.” For social ties, residents were asked “about how many close relatives, friends, or neighbors like this do you have?” To measure social ties and support from all three sources (i.e., family, friends, and neighbors), two composite measures were developed. One point was awarded if the resident responded “yes” to having family or friend support, or “often/sometimes” to having neighbor support. The final overall social support measure ranged from 0 to 3, with higher scores representing more support. The same scoring system was used for social ties, with higher scores representing more ties (range 0–3).

Dietary behaviors

For dietary outcomes, we used the 14-item PrimeScreen questionnaire (Rifas-Shiman et al., 2001). Individuals were asked how frequently they ate or drank a number of items during the previous week. All dietary factors were calculated as servings per day. Fruit and vegetable servings were created by aggregating six questions: 100% orange or grapefruit juice; other 100% fruit juices; fruit; green salad; baked, boiled or mashed potatoes; and vegetables. Sugar-sweetened beverages or sugary drinks comprised of drinks with added sugar, like regular soda, coffee, or fruit drinks. Sugary snacks included items such as cake, donuts, cookies, pie, or candy. Fast food included meals from establishments such as McDonald's, Wendy's, and Taco Bell. Red meat was derived from two questions that asked about intake of beef, pork or lamb as a main dish as well as processed meats.

Physical activity and sedentary behavior

Two of the questions captured the participants' average duration of vigorous physical activity followed by moderate physical activity that lasted at least 10 min at a time, over the course of the previous week. Sedentary behavior was determined by calculating total hours of sitting time per day, while at work and at home (Craig et al., 2003).

Statistical procedures

Bivariate analyses examined associations between family, friend, and neighbor social support and ties with socio-demographic characteristics, diet, and physical activity. Multivariable linear mixed effects models were constructed for each social support and ties variable with each outcome, controlling for covariates. The clustering of subjects within sites was controlled for by including site as a random effect. Outcomes that were not normally distributed were log-transformed; these included all diet outcomes except for fruit and vegetables, vigorous physical activity, and moderate physical activity. Analyses were run in 2011 using SAS version 9.2 (SAS Institute, Cary, NC).

Results

Descriptive statistics

Table 1 presents characteristics of the HIC sample. An overwhelming majority was female, married, and lived below the poverty line. The mean age was 44 years. Most self-identified as Hispanic, followed by Non-Hispanic Black race/ethnicity. Only a third of the sample had more than a high school diploma.

Over 80% of participants had any family social support, with an average of four family members (ties) providing support. Sixty percent had any social support from friends with an average of three friends (ties) providing support. Fifty percent indicated never/rarely getting social support from neighbors versus often/sometimes, with less than one neighbor (ties) providing support.

The mean intake of fruit and vegetables was 2.6 servings per day. On average, residents consumed roughly half a serving of sugary snacks and less than one sugary drink per day. Mean daily fast food intake was nearly 0 (although over 40% consumed one daily serving of fast food-result not shown). Residents reported consuming half a serving of red meat per day. Participants reported a mean of 0.6 h of daily vigorous physical activity and 4.8 h of total daily sitting.

Diet bivariate and multivariable results

In bivariate analyses (results not shown), higher fruit and vegetable intake was positively associated with friend social ties. Consuming more sugary drinks was associated with lower education, and Hispanic, White or Black race/ethnicity compared to “other” race/ethnicity, while more sugary snacks were associated with younger age and White race/ethnicity. More fast food consumption was associated with more social support and ties, family social ties, friend support, some high school compared to grade school education, younger age, male, Hispanic or “other” race/ethnicity, and not being married. Higher red meat consumption was associated with more overall social support and ties, friend support, neighbor social ties, higher education, and younger age.

When socio-demographic characteristics were controlled (Table 2), overall social support remained significantly associated with more red meat ($p=0.029$). Friend social ties also remained significantly associated with fruit and vegetable consumption ($p=0.0074$), such that residents with more friends were more likely to consume higher quantities of fruit and vegetables. Family social ties were positively associated with more sugary drinks ($p=0.013$) and fast food ($p=0.011$). Neighbor social ties were also associated with more fast food consumption ($p=0.024$).

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