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Social isolation, support, and capital and nutritional risk in an older sample: ethnic and gender differences

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Abstract

This study examines the relationships that exist between social isolation, support, and capital and nutritional risk in older black and white women and men. The paper reports on 1000 community-dwelling older adults aged 65 and older enrolled in the University of Alabama at Birmingham (UAB) Study of Aging, a longitudinal observational study of mobility among older black and white participants in the USA. Black women were at greatest nutritional risk; and black women and men were the groups most likely to be socially isolated and to possess the least amounts of social support and social capital. For all ethnic–gender groups, greater restriction in independent life–space (an indicator of social isolation) was associated with increased nutritional risk. For black women and white men, not having adequate transportation (also an indicator of social isolation) was associated with increased nutritional risk. Additionally, for black and white women and white men, lower income was associated with increased nutritional risk. For white women only, the perception of a low level of social support was associated with increased nutritional risk. For black men, not being married (an indicator of social support) and not attending religious services regularly, restricting activities for fear of being attacked, and perceived discrimination (indicators of social capital) were associated with increased nutritional risk. Black females had the greatest risk of poor nutritional

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health, however more indicators of social isolation, support, and capital were associated with nutritional risk for black men. Additionally, the indicators of social support and capital adversely affecting nutritional risk for black men differed from those associated with nutritional risk in other ethnic–gender groups. This research has implications for nutritional policies directed towards older adults.

Keywords

Social isolation; Social capital; Social support; Ethnicity; Gender; USA

Introduction

This study examines the unique relationships that exist between social isolation, support, and capital and nutritional risk in older black and white women and men. This is an important topic because it takes into account how various aspects of social structure may affect individuals' health differentially depending upon one's ethnicity and gender. Additionally, this paper focuses on nutritional health, an area not studied extensively in medical sociology, but which is particularly well-suited for the study of social isolation, support, and capital, as most food and eating activities involves social engagement with others, as well as the study of health, as food and eating are essential for living a healthy life.

Overview of social isolation, support, and capital

Social isolation—Despite being one of the major foci in American sociology, particularly among urban and poverty scholars, the concept of social isolation is one that is not well-defined within sociology (Klinenberg, 2002a). The different uses of the term are frequently confused with the concepts of both social support and capital. Within the gerontological literature and increasingly among urban sociologists there is a movement to restrict the concept of social isolation to its literal meaning of "the personal isolation of individuals from one another" (Klinenberg, 1999, 2002a, b; Krause, 1993). Researchers who have used this literal definition have found that certain individuals who are physically social isolated from others, particularly the elderly poor and frail residents of violent neighborhoods, experience poorer outcomes, including poorer health outcomes.

Social support—Social support refers more specifically to assistance provided to individuals (including emotional or tangible), the frequency of contact with others, and the perceived adequacy of that support (Hooyman & Kiyak, 2002). Strong and compelling evidence covering an extended time span links social support and networks with positive health outcomes (Thoits, 1995; House, Umberson, & Landis, 1988). The affect of social networks and support may vary according to group membership, as well. As persons age, their need for social support increases. A large body of research consistently shows that older adults with better social support systems experience better health. However, the mechanisms by which social support affects health is varied. Individuals may be encouraged to participate in healthy lifestyles and discouraged to participate in unhealthy lifestyles or vice versa depending upon their social support system. Additionally, receipt of social support may directly or indirectly enhance one's capacity to enhance personal competence and enable one to access needed resources or services.

Social capital—Social capital refers to the public resources accessible to individuals through their engagement in various community and social structures that can be drawn upon to produce some beneficial outcome. The major proponents of social capital agree that active participation in group life and interaction with others is an essential feature of social capital (Putnam, 2000; Portes, 1998; Coleman, 1988; Bourdieu, 1983, 1991). Some proponents emphasized that

social capital requires relationships to be of an enduring nature with qualities internalized within individuals, and with consequences expressed as trust in these associations (Paxton, 2002; Coleman, 1988; Bourdieu, 1983). Kawachi and Berkman (2000) maintain that social capital within communities affects health by promoting healthy behaviors and discouraging unhealthy ones, by increasing access to health services and amenities, and by enhancing psychosocial processes through the provision of emotional support in trusting social environments.

Social capital may be conceptualized as a property of individuals, small groups, communities, or even larger entities (Macinko & Starfield, 2001; Portes, 1998). At the individual level, persons are able to secure benefits because of their membership in some network or larger social structure (Portes, 1998; Coleman, 1988). At the group level, members of the group are able to secure benefits because of the enduring nature of the relationships that have become institutionalized within the group (Bourdieu & Wacquant, 1992). Last, at the community level and beyond, social capital "refers to social organization, such as trust, norms, and networks, that can improve the efficiency of society by facilitating coordinated actions" (Putnam, Leonardi, & Nanetti, 1993, p. 167). At this level, benefits accrue to the individual as the result of membership within the larger community.

Social capital may result in either positive or negative consequences. Positive consequences of social capital include the exercise of social control through the observance of norms (primarily through tight community networks), family support, and benefits through extra-familial networks (Portes, 1998). All of these positive consequences include elements of social reciprocity and support and trust (Putnam, 2000, p. 22). Negative consequences of social capital include restricted access to opportunities, restrictions on individual freedom, excessive demands on group members, and downward leveling norms (Portes, 1998, p. 8).

This study focuses on the relationships that exist between social isolation, social support, and social capital, primarily at the individual level, and their relationships with nutritional health. While social isolation and support are conventionally studied at the individual level, some proponents of social capital theory maintain that social capital is a quality of social structure, rather than individual actors, and, as such, requires measurement at this level (See Lochner, Kawachi, & Kennedy, 1999; Kawachi & Berkman, 2000 for a discussion of this). Veenstra (2000) has presented the argument, though, that "If there is a relationship between social capital and the health of populations. . . then perhaps some of the variance in health status is explained by trust, civic norms, civic participation and social engagement professed and engaged in by individuals. . . . (thus), cross-sectional individual-level analysis can still shed some light on the relationship between social capital and health (p. 621)." This paper adopts a similar position, but rather than compare communities, we compare ethnic and gender groups for variance in social capital and nutritional health. Kawachi and Berkman (2000) specifically describe how women and African Americans may be restricted in their access to social capital. We additionally examine the differences that exist between groups in regard to social isolation and social support and nutritional health.

Overview of social isolation, support, and capital and nutritional risk in community-dwelling older adults

Poor nutrition in older adults is a well-recognized and serious problem with significant health, economic, and social consequences (Institute of Medicine, 2000). While poor nutrition has been defined in a number of ways, it is estimated that between 37% and 40% of community-dwelling older adults aged 65 and older experience inadequate nutrient intake (Ryan, Craig, & Finn, 1992). Those groups most likely to experience poor nutrition are black individuals, women, the poor, those with lower education, and those who are homebound (Coulston, Craig, & Voss, 1996; Fried & Walston, 1999; Frongillo, Rauschebach, Roe, & Williamson, 1992;

Institute of Medicine, 2000; Ponza, Ohls, & Millen, 1996; Quandt & Chao, 2000; Quandt & Rao, 1999; Roe, 1990; Sharkey & Haines, 2001; Sharkey, Haines, & Zohoori, 2000; Weimer, 1998).

Social isolation and nutritional risk—A number of social isolation factors associated with poor nutrition in older adults. Geographic location is important in regard to general health outcomes. Several factors may influence the poorer nutritional health outcomes of older adults living in rural communities (Quandt & Rao, 1999). Rural communities are more likely to rely on home-food production compared to urban communities, which possess a greater number of retail food markets (Quandt, Popyach, & DeWalt, 1994; Crockett, Clancy, & Bowering, 1992; Morris, Bellinger, & Haas, 1990). The reliance on home-food preparation may be especially problematic for older adults who are functionally impaired and no longer able to produce their own food. Additionally, government food programs to provide for older adult nutritional support are limited in rural areas because of inadequate transportation and a reduced tax base (Krout, 1994).

Additionally, having an adequate transportation system within one's community is an important component of social isolation because transportation physically enables individuals to more fully participate in an active community life. Having an inadequate transportation system restricts individuals' opportunities to community resources that may be available. Individuals with poor access to food and community resources (such as food stamps or home-delivered meal programs), and those who are in need, but without a caregiver, are more likely to experience poor eating behaviors (Ryan & Bower, 1989; Davies, 1984; McIntosh, Shifflett, & Picou, 1989; McIntosh & Schifflett, 1984).

Last, in regard to social isolation, as Kopec (1995) points out, functional impairments that lead to restrictions in individuals' life–space reduce the capacity for social activity. Older adults' capacity to benefit from available community resources may be curtailed because of reduced mobility. Additionally, as observed by Lee and Frongillo (2001), food insecurity associated with functional impairment results from limited food affordability, availability, accessibility and altered food use.

Social support and nutritional risk—An array of social support factors also correlate with poor nutrition in older adults. The positive benefits conferred to those who are married, especially men, has been repeatedly demonstrated in regard to nutritional health in older adults (Frongillo et al., 1992; Torres, McIntosh, & Kubena, 1992; Davis, Randall, Forthofer, Lee, & Margen, 1985; Davis, Murphy, Neuhaus, Gee, & Quiroga, 2000). Persons who are married are less likely to skip meals and better able to afford them. Older men who are not married, particularly those who are widowed, are vulnerable to experiencing poor nutritional health because they have not been socialized to be feeders and often do not know how to shop or cook for themselves. Women, especially those who are widowed, are also vulnerable to poor nutritional health because they may not be able to afford an adequate diet. Additionally, women traditionally cook for others; and it is one of the primary ways they express their care for others (DeVault, 1991). When older women no longer have anyone to cook for, they may be less inclined to cook only for themselves (Quandt, McDonald, Arcury, Bell, & Vitolins, 2000). Lack of social support, having a limited social network, being socially isolated, particularly living alone or being divorced, separated, or widowed, especially for men, are risk factors for poor nutritional intake or status (Frongillo et al., 1992; Torres et al., 1992; Ryan & Bower, 1989; Davis et al., 1985, 2000; Davies, 1984; McIntosh, Shifflett, & Picou, 1989; McIntosh & Schifflett, 1984). Both black and white older adults have been reported to have better diets if they live only with a spouse (Davis et al., 2000).

Social capital and nutritional risk—There are a number of indicators of social capital that may be associated with nutritional health. Socially cohesive neighborhoods may be a significant source of social capital for many older adults. It has been estimated that 70% of the care that community-dwelling older adults receive is provided for by relatives, friends, and neighbors (Rabin & Barry, 1995). Neighbors may be a convenient resource who are often readily available to assist in shopping and meal preparation activities. Recent research, however, has found that neighborhoods may not be beneficial for all residents (Ross, Reynolds, & Geis, 2000). Individuals may reside in a particular neighborhood because they have no other options. Findings from the research of Ross and her colleagues indicate that neighborhood stability is associated with reduced distress in affluent communities, but not in those that are poor.

Various dimensions of religion, as a form of social capital, have been shown to have significant positive effects on health (Fetzer Institute/National Institute on Aging Working Group, 1999). Regular religious participation may directly affect nutritional health through several mechanisms. First, religious norms often ensure that followers practice healthier lifestyles, including eating well. Second, individuals who attend religious services on a regular basis are more embedded in a social network and support system where they are in frequent contact with others. Alabama is in the heart of what is commonly referred to as the “Bible Belt.” It is not unusual for church members to gather at least twice a week for fellowship, with eating together often being an integral part of the institutionalized activities. Indeed, Ferraro (1998) found that obesity was found to be highest in states with the highest religious affiliation and highest among Southern Baptists, Fundamentalists, and Pietistic Protestants (groups common in the South). Last, church members may receive instrumental support if they need it, especially in regard to the provision of food or transportation. Religious commitment has been found to be associated with better dietary behavior and dietary adequacy (McIntosh & Schifflett, 1984). Similarly, older adults may restrict themselves to eating only certain foods because of cultural beliefs about what is religiously, ethnically, or regionally appropriate to eat (Locher, Burgio, Yoels, & Ritchie, 1997).

Last, nutritional health may be affected by the trust individuals have in their communities. If individuals are frightened to move about in their community, they cannot fully participate in community life; and, as a consequence, are not able to secure benefits that may be available to them. Research has demonstrated that women and older adults are more likely than others to restrict their activities for fear they may be victimized (Clemente & Kleiman, 1977; Gordon & Riger, 1991; Madriz, 1997; Riger & Gordon, 1991; Skogan, 1987). Further, older women are much more likely than other groups to limit their activities through the strategy of not going outside of their homes (Madriz, 1997). Individuals who restrict their activities through self-isolation are not able to actively participate in community life and interact with others, and therefore, are not able to reap the benefits that potentially may exist for them.

Additionally in regard to matters of feeling secure in one's community, Williams (2000) describes well how racism and discrimination, at both the individual and institutional levels, can affect health by restricting socioeconomic opportunities and mobility. Health is also affected through residence in poor neighborhoods, racial bias in medical care, stress associated with discrimination, and acceptance of the stigma of inferiority. Gender and age discrimination may have similar deleterious effects and operate in the same manner as racial discrimination.

Last in regard to social capital, being a veteran affords one benefits through participation in a network of services sponsored by veterans’ groups or the Veteran's Administration, including especially medical and social services that are most relevant to nutritional health. These services are not available to those who have not served in the military. Additionally, these services to which veterans are entitled to use exist above and beyond similar civilian services,

which veterans may use as well. Last, being a veteran may have provided individuals with earlier exposure or opportunities for health care and education.

Additional factors associated with nutritional risk in older adults—Additional factors associated with nutritional risk in older adults include advancing age, education, and income. Advancing age is associated with declining nutritional health, as well as the co-morbid conditions associated with poor nutrition (Institute of Medicine, 2000). Undernutrition, as measured by anthropometric measures, biochemical markers, and caloric intake has been found consistently to be more prevalent in older adults.

Education may affect nutritional health through a number of mechanisms, as well. Mirowsky, Ross, and Reynolds (2000) maintain that education is “the key to position in the stratification system” (and is) the root component of social status”, consequently influencing both income and occupation (p. 50). Mirowsky and Ross (1998) propose a “human capital hypothesis,” arguing that “education improves health because it increases effective agency” (p. 35). Of most relevance for this paper are the ideas “that education enables people to coalesce health-producing behaviors into a coherent lifestyle (and) that a sense of control over outcomes in one's life encourages a healthy lifestyle” (p. 36). Participants who are better educated may be better informed regarding the nutritional quality of their diet and the impact that diet has on health. They may also be able to access resources available within the community better.

Last, income may be associated with poor nutritional health. Poverty is a major factor contributing to poor nutritional intake (Cohen, Burt, & Schulte, 1993; Unosson, Ek, Bjurulf, & Larsson, 1991; Roe, 1990; McIntosh et al., 1989; Davis et al., 1985). Older persons on Medicaid, who represent the poor of society, have been found to be at particularly high nutritional risk (Posner et al., 1993; Frongillo et al., 1992). Persons of lower socioeconomic status may not be able to afford to purchase food, or they may not be able to purchase food that is nutritionally dense. In addition, persons who are homebound experience the double burden of having to pay not only for their food, but also for someone to get their food. Poverty also is associated with other social conditions, such as lower educational levels, which contribute to social isolation and lesser ability and power to command and access community resources and services, including home-delivered meals programs (Roe, 1990). Only a third of older adults eligible for federal programs to combat hunger actually receive those services (Burt, 1993).

This paper examines the associations between social isolation, support, and capital and nutritional risk. These associations are examined separately for black women, black men, white women, and white men in order to explore which factors are of most importance for each group in protecting against nutritional risk.

Methodology

Sample

This paper reports on 1000 community-dwelling older adults aged 65 and older who were enrolled in the University of Alabama at Birmingham (UAB) Study of Aging (1999–2001), a longitudinal observational study of mobility among older blacks and whites. Recruitment was based upon a random sample of Medicare beneficiaries residing in five central Alabama counties. Sampling was stratified according to race, gender, and urban/rural residence. The sample was 50% black, 50% female, and 51% rural. The study protocol was reviewed and approved by the UAB Institutional Review Board.

Design

Participants were administered a questionnaire in their homes using a standard interview format. The questionnaire consisted of items related to mobility, overall health status (including nutritional health), and social isolation, support, and capital.

Measurement

Nutritional risk—Nutritional risk was measured as a continuous variable using an adaptation of the Nutrition Screening Initiative's DETERMINE checklist (Nutrition Screening Initiative (NSI), 2004). The NSI checklist was developed jointly by the American Dietetic Association, the American Academy of Family Physicians, and the National Council on Aging; and is used routinely by health professionals and providers of nutritional support services to identify older adults at-risk for malnutrition, as well as by researchers investigating risk factors for poor nutritional health (Sharkey, 2002; Chernoff, 2001; Joseph et al., 1997; Ponza et al., 1996; Spangler & Eigenbrod, 1995; Posner et al., 1993; Vailas, Nitzke, Becker, & Gast, 1998). The DETERMINE checklist is a brief ten-item questionnaire with scores ranging from 0 (lowest risk) to 21 (highest risk). A score of six or more is indicative of high nutritional risk. Items making up the checklist include warning signs of poor nutritional health including eating poorly (e.g., skipping meals) and known factors associated with eating poorly. These items, along with the indicators used in this study to assess each item, followed by the score assigned to each item in parentheses are included in the appendix.

Social isolation—Social isolation was measured using rural versus urban residence, having an adequate transportation system, and mobility status.

Rural versus urban: Individuals were defined as residing in a rural community if they lived in Pickens, Hale, or Bibb counties (less than 21,000 individuals per county). Individuals were defined as living in an urban community if they resided in Jefferson or Tuscaloosa County. Jefferson and Tuscaloosa counties are located in the Standard Metropolitan Statistical Area surrounding and encompassing Birmingham, AL.

Adequate transportation system: Transportation was assessed by asking the question: “Over the past 4 weeks, have you had any difficulty getting transportation to where you want to go?” Response categories included: no difficulty, a little difficulty, a lot of difficulty. Transportation was defined as consisting of both public and private means of getting around, including any services available specifically for older adults.

Mobility: Mobility was measured using the independent life–space measure derived from the UAB Study of Aging Life–Space Assessment (Baker, Bodner, & Allman, 2003). This assessment reflects the distance that a person moved in the 4 weeks prior to the interview and whether or not equipment or assistance from another person was used during such travel. Independent Life–Space is determined by assigning persons the level representing the highest zone attained, using neither assistive devices or help from another person. This measure of functional mobility has the advantage of not being contaminated by receipt of social support, as are other measures of functional status. Levels of life–space include: limited to the room where one sleeps (0), limited to within one's dwelling (1), limited to the space just proximal to one's personal living space (2), limited to one's neighborhood (3), limited to one's town (4), and unlimited, getting outside one's town (5).

Social support—Marital status and perceived social support were used to measure social support.

Marital status: Marital status was assessed by simply asking: "Are you now married, or are you widowed, separated, divorced or have you never been married?" This item was coded as either being married or not being married.

Perceived social support: An adaptation of the Arthritis Impact Measurement Scale for Social Support was used to assess general perceptions of social support (Meenan, Mason, Anderson, Guccione, & Kazis, 1992). Items included in the scale are: "How often did you feel that your family or friends would be around if you needed assistance?, How often did you feel that your family or friends were sensitive to your personal needs?, How often did you feel that your family or friends were interested in helping you solve problems?, How often did you feel that your family or friends understood how getting older has affected you?" Response categories were: always (0), very often (1), sometimes (2), almost never (3), and never (4). Scores were summed, and higher scores indicated less perceived support.

Social capital—Individual-level attributes, including both attitudinal and behavioral indicators, were used to measure social capital. Two domains of social capital were operationalized for consideration in this study. These included: (1) community and neighborhood characteristics and (2) trust in community. Additionally, we considered the influence that participation in the military had on nutritional risk.

Community and neighborhood characteristics: Community characteristics included years at residence and regular participation in religious activities.

Years at address: Embeddedness in one's local neighborhood was assessed by asking individuals: "How long have you lived at this address?" This variable was coded in years.

Regular religious participation: Regular religious participation was measured by the question: "How often do you usually attend church or other religious meetings?" This item was coded as: more than once a week, once a week, a few times a month, a few times a year, once a year or less, or never. Participants were defined as attending religious services regularly if they responded affirmatively to a few times a month or more.

Trust in community: Two aspects of trust in community were included in this study: fear of being robbed or attacked and perceived discrimination.

Fear of being robbed or attacked: Fear of being robbed or attacked was measured using the question: "Do you limit your activities because you are afraid you might be robbed or attacked?" The item was coded as either yes or no.

Perceived discrimination: We measured discrimination along each of these dimensions by asking participants: "In the last 6 months, have you experienced any discrimination based on your (1) age, (2) gender, (3) race or skin color?" An affirmative response to any of these forms of discrimination was coded as yes to perceived discrimination.

Participation in the military: Because so few women participants were veterans, this variable was included only for men. This was assessed by asking participants if they were a veteran.

Control variables—Because of the potential effects of age, level of educational, and income on nutritional health, we controlled for these variables in our analyses.

Age: Age was included in this study as a continuous variable.

Level of education: Level of education was controlled for as an indicator of socioeconomic status. Education was coded as highest level of education completed including sixth grade or less, between sixth and twelfth, high school graduate, technical school, college, graduate level.

Income: Income was measured as household income, and included the categories: <$5000; $5000–$7999; $8000–$11,999; $12,000–$15,999; $16,000–$19,000; $20,000–$29,000; $30,000–$39,999; $40,000–$49,999, and ≥$50,000.

Statistical analyses

A univariate analysis of variance was performed initially to assess the main and interactive effects of ethnicity and gender on nutritional risk in order to determine whether subsequent analyses performed on the groups separately was appropriate. Next, ethnicity and gender were combined to create a single variable with participants categorized as black female, black male, white female, or white male; and a one-way analysis of variance was performed to assess whether and which groups differed significantly from one another on nutritional risk.

Descriptive statistics were used to characterize the sample. One-way analyses of variance or Chi-square analyses, where appropriate, were used to test group differences between black females, black males, white females, and white males on the individual items included in the Nutrition Risk Index, all measures of social capital, social support, age, level of education, and mobility.

Last, multiple linear regression was performed separately for each group to identify independent predictors of nutritional risk. Multi-collinearity was evaluated prior to performing the regression analyses, and the highest correlation was 0.377. Thus, all variables were appropriate for use in the models.

Results

There were 249 black women, 251 black men, 250 white women, and 250 white men included in the sample. A total of 21.3% of participants were at high nutritional risk (using a cutpoint of ≥6 on the nutrition risk index). Black women were most likely to have high nutritional risk (30.9%) compared with white women (21.6%), black men (25.5%) and white men (7.2%). Examining nutritional risk as a continuous variable, black women were at highest risk with a score of 4.4 compared with black men (3.6), white women (3.3), and white men (2.4).

The univariate analyses of variance revealed significant main effects for both ethnicity ($F(1)=40.851$, $p<0.001$) and gender ($F(1)=20.639$, $p<0.001$) and nutritional risk, but no interaction effect between ethnicity and gender. Additionally, one-way analysis of variance revealed a significant difference between the groups on nutritional risk ($F(3)=20.491$, $p<0.000$), with post hoc analysis using Tukey HSD, revealing that all groups differed significantly from one another with the exception of black men and white women, whose scores were almost identical.

There was no single nutritional risk item that contributed more to black women being at greater risk (see Table 1). For nearly every indicator of nutritional risk, black women reported either the highest or next to highest prevalence.

The groups differed significantly for all indicators of social isolation, support, and capital except living in a rural community and years residing at present address (see Tables 2 and 3). Black women and black men were the groups who reported being most socially isolated and possessing the least amounts of social support and capital, with black women being slightly more disadvantaged overall (Table 2). Additionally, black women reported the lowest income; and black men reported the lowest education (see Table 4). For all indicators of social isolation,

support, and capital where the groups differed significantly, with the exception of perceived social support and regular religious participation, white men had the greatest advantage.

Multiple linear regression was performed separately for each group in order to identify independent predictors of nutritional risk while controlling for other potential predictors (see Table 5). Except for black men, there were more similarities between groups than differences. For all groups, having a more restricted life–space was associated with nutritional risk. For both black women and white men, not having reliable transportation was associated with nutritional risk. Additionally, for black women, white women and men, having a lower income was predictive of nutritional risk. For white women only, perceived low levels of social support was associated with nutritional risk. For black men, not being married, not attending religious services regularly, restricting activities for fear of being attacked, and perceived discrimination were associated with increased nutritional risk.

Discussion

In this study of community-dwelling older adults, being a black female was associated with the greatest risk of experiencing poor nutritional health. Black women were at highest nutritional risk, followed by black men, white women, and, last, white men. Specifically, black women were significantly more likely to report not having enough money to buy food, taking three or more medications, experiencing a recent significant change in weight, and having difficulty either shopping, cooking, or feeding one's self. Black women also were more likely to report experiencing a poor appetite and eating irregularly or skipping meals, although these associations were not statistically significant. The overall direction of these relationships, however, clearly indicates that black women were at increased risk for poor nutritional health regardless of the specific item used to assess poor nutrition. Additionally, black women were most likely to be socially isolated and to possess the lowest amounts of social support and capital. This relationship held across all measures and was statistically significant in regard to not having a reliable source of transportation (22.1%), to being limited in life–space to the room where one sleeps (24.9%), to limiting activities for fear of an attack (30.5%), and to not being married (79.5%). These findings are not new; much research over an extended period of time has documented the disadvantaged position that women and minorities experience in society across multiple domains, including health. Black women experience the cumulative disadvantage of being both female and black.

Despite black women's experience of being at greatest nutritional risk coupled with their being most socially isolated and possessing the lowest amount of social support and capital, of greatest note in this study are the findings that more indicators of social support and capital adversely affected nutrition risk for black men. Additionally, the indicators of social support and capital that adversely affected nutrition risk for black men were different from those that affected nutritional risk in other ethnic–gender groups. In fact, the other ethnic–gender groups were more similar than not, especially in regard to social isolation and lower income being associated with nutritional risk.

For black men, of most importance in this study are the findings that relate to social capital, including trust in community and regular religious participation. Both measures of trust in community, including limiting activities for fear of being attacked and experiencing discrimination within the past 6 months, were associated with increased nutritional risk only for black men. The threat of violence and the experience of discrimination is a very real one for black men who have lived their lives in a segregated south where threats may come from both the white community and the black community. Thus, older black men either may lack adequate community resources (such as grocery stores, nutrition services, etc.) because of the impoverished segregated communities they live in or their access to those resources that do

exist may be curtailed because of the real or perceived fear and/or discrimination in attempting to do so. Others have made similar observations related to racism and discrimination and health overall (see e.g., Williams, 2000). A limitation of our findings is that our measures of trust may be more accurately viewed as measures of distrust. An additional limitation of our measures of trust in community is that it is not known if participants experienced fear or discrimination within or outside their communities. Future research might more carefully distinguish between these in regard to nutritional risk.

Also at the level of social capital, not attending regular religious services was associated with higher nutritional risk for black men. Of particular note here is that black and white men were the groups least likely to report regular religious participation, 67.3% and 63.2%, respectively, while black women and white women were much more likely to report regular religious participation, 81.1% and 77.2%, respectively. Many eating activities take place within Southern churches, both black and white. While regular religious participation may lead to poorer nutritional outcomes such as obesity, regular religious participation may also provide opportunities to eat for those who may be undernourished. Additionally, women, traditionally the ones who prepare meals, are more likely to spend time at church events. Thus, black men who did not attend religious activities regularly may not have reaped the potential nutritional benefits of doing so. The same relationship may not have held for white men because the majority of them had wives who were still preparing meals, even though white men attended religious services less regularly than black men. The same relationship does not hold true for black men, because they were less likely to be married. Indeed, not being married (an indicator of social support) was a predictor for nutritional risk for black men only, lending further support to this interpretation of our findings.

Despite these unique associations for black men, there were similarities between the other groups. For example, for both black women and white men higher nutritional risk was associated with not having reliable transportation. Not having reliable transportation restricts access to resources that may be available to individuals either within or outside their communities. Other studies have also found that older women, particularly minority women, are less likely to drive or to stop driving earlier in life (Cape, 1987; Kington, Reuben, Rogowski, & Lillard, 1994; Marottoli et al., 1993; Siegel, 1996). Additionally, southern communities, and particularly, rural communities are less likely to have adequate public transportation so that older adults are more dependent on others (Arcury, Quandt, Bell, McDonald, & Vitolins, 1998; Quandt & Rao, 1999). Older white men are the group most likely to have driven throughout their lives and the group most likely to be responsible for transporting others, particularly their wives who never learned to drive. When these men are no longer able to drive, for any reason, they may be the group least likely to find others to transport them.

At the level of social support, for white women only there was an association between low levels of perceived social support and nutritional risk. These findings are not particularly unexpected because the instrument used to assess perceived social support tapped into perceptions of emotional types of support and whether individuals felt that significant others were aware of their needs or feelings and willing to help. Women have traditionally been the emotional caretakers in the family, both for spouses and children. It is not surprising, then, that those closest to these women would not be aware of their needs or feelings—as this would involve a reversal of roles, both the husband and wife roles and the parent and child roles.

For both black and white women and white men, lower levels of income were associated with higher levels of nutritional risk. This supports previous research, which has found that persons with lower socioeconomic status are more vulnerable to nutritional risk. Income is one measure of socioeconomic status that reflects spending power. In this study, education (also an indicator of socioeconomic status) did not predict nutritional risk for any group. Not having enough

income may prevent persons from being able to obtain enough food to eat. Additionally, because indicators of social isolation were predictive of nutritional risk for all ethnic–gender groups in this study, persons with lower incomes may either not be able to afford to pay someone to grocery shop for them or to transport them to a grocery store.

Not unexpectedly, lower levels of independent life–space were associated with higher nutritional risk for all groups. This finding is not unexpected, as researchers have recently begun documenting the association between function and nutrition risk (Sharkey, 2002; Lee & Frongillo, 2001). Individuals may not be able to go outside of their homes to access community resources, and they may not be able to prepare or consume food within their own homes. Factors associated with social isolation, support, and capital, as well as reduced income, are especially important to consider in understanding nutritional risk of those with functional impairments compared to those without the same degree of impairment.

This research has several implications for nutritional policies directed towards older adults. First, clearly there is an opportunity to address nutritional risk in community-dwelling older adults by effecting changes in various aspects of community- and social life. The Elderly Nutrition Program (ENP), authorized by Congress under the auspices of the Administration on Aging under the Older Americans Act, is the largest program designed to coordinate community- and home-based nutrition services to older adults (Millen, Ohls, Ponza, & McCool, 2002). As Wellman, Rosenzweig, and Lloyd (2002) summarize, its original intent was to provide more than merely a meal. It was also intended to: decrease malnutrition, prevent physical and mental deterioration, promote health, reduce social isolation, link older adults to social and rehabilitative services, and provide low-cost, nutritionally sound meals. Food services (i.e., Meals on Wheels and congregate meals) are managed by State and Territorial Units on Aging and local Area Agencies on Aging and delivered by members of the local community (including volunteers). As Wellman (1999) points out, however, funding has not increased to meet the demand for services; and only 7% of the high-risk population participates in the ENP, including approximately 25% of low-income and minority older adults. Wellman (1999) recommends that programs need to more accurately assess those most in need of services. This paper provides some direction in considering what factors might be used in deciding who has the greatest need, particularly in the presence of health disparities.

Second, findings from this research suggest that not all programs or policies aimed at alleviating hunger in older adults will have the same impact because different factors affect nutritional risk for different groups. Older adults are a heterogeneous group whose diverse needs ought to be taken into account in this regard. For example, Wellman (1999) also recommends that nutrition education, a component of the ENP that has not received the highest priority, needs to be developed and evaluated.

Lastly, this research found that what contributes most to nutritional risk is social isolation and lower income, particularly for black women, white women, and white men. This was indicated by several variables including not having adequate transportation and having limited independent life–space. For black men, however, measures of social support and capital were most important in predicting nutritional risk. Programs need to be targeted specifically to individuals who, for whatever reason, either do not have access to community food or food services or whose access is restricted, as in the case of black men. For example, initiatives need to focus on either providing transportation services so that individuals can access various food sources or bringing the food to participants. It is not enough to provide congregate meals, if persons are unable or afraid to get to the meal site. Because of the limitations of nutritional services currently available to high-risk older adults, different types of programs ought to be considered. For example, some communities are experimenting with providing older adults with several frozen meals at a single delivery. Frozen meals, groceries, and food commodities

could also be mailed directly to the homes of homebound older adults. Such programs would not only directly improve nutrition, but indirectly impact on health, quality of life, and potentially enable older adults the means to maintain independence within the community.

The generalizability of findings from this study is limited by its reliance on data from older adults living in the southeastern region of the United States. This does not, however, limit the importance of the findings. One might expect that the more general findings of our study extend to other regions, as well. Future research might address these matters.

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Appendix

Nutrition risk index

1. I have an illness or condition that made me change the kind and/or amount of food I eat./Would you say your appetite is usually very good, good fair, poor? (with fair or poor scoring 2 points).
2. I eat fewer than two meals per day./How many meals do you usually eat a day? One meal, two meals, three or more meals, irregular, tube fed (with one meal, two meals, or irregular scoring 3 points).
3. I have three or more drinks of beer, liquor or wine almost every day./On the days when you drink, about how many drinks do you usually have? (with three or more scoring 2 points).
4. I have tooth or mouth problems that make it hard for me to eat./Have you made any changes in the foods you eat due to problems with your teeth, your mouth, or swallowing? (with a yes response scoring 2 points).
5. I do not always have enough money to buy the food I need./How hard is it for you to pay for the very basics like food, housing, medical care, and heating? Not very difficult, somewhat difficult, very difficult (with very difficult being scored a 4).
6. I eat alone most of the time./Counting yourself how many people live in your household (with 1 being scored a 1).
7. I take three or more different prescribed or over-the-counter drugs a day./Based upon an inventory of participant's medications. (three or more different prescribed or over-the-counter drugs a day scored as 1).
8. Without wanting to, I have lost or gained 10 lb in the last 6 months./In the past year have you lost weight (more than 10 lb), gained weight (more than 10 lb), both lost and gained weight (more than 10 lb), had no weight change? (two points for any weight change of more than 10 lb).
9. I am not always physically able to shop, cook and/or feed myself./Do you have difficulty: eating, preparing meals, or shopping? (two points for a yes response to any of these items).
10. One additional item (I eat few fruits or vegetables, or milk products.) was not included in this study.

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Table 1

Individual nutritional risk items (% reporting)

	Black women	Black men	White women	White men	*p* value
Poor appetite	19.7	17.1	17.6	14.4	0.479
Irregular or skipped meals	4.8	4.0	1.2	2.4	0.089
High alcohol consumption	0.8	4.8	1.6	6.4	0.001
Oral health problems	14.9	19.5	10.0	9.2	0.002
Not enough money for food	21.3	19.1	8.8	3.6	<0.001
Lives alone	38.2	29.9	43.6	16.4	<0.001
Polypharmacy	72.3	62.5	68.8	60.4	0.018
Significant recent weight change	41.4	23.9	28.4	23.2	<0.001
Difficult to shop, cook, or feed self	36.5	24.7	30.8	18.4	<0.001

Table 2

Social isolation, support, and capital by ethnicity and gender

	Black women	Black men	White women	White men	*p* value
Social isolation					
Live in rural area (%)	51.4	50.6	51.6	52.0	0.991
No reliable transportation (%)	22.1	9.6	9.2	3.2	<0.001
Social support					
Not married (%)	79.5	41.4	54.0	20.0	<0.001
Social support scale (mean)	6.0	6.6	5.8	5.9	0.016
Social capital					
Years at address (mean)	29.2	26.5	26.2	26.5	0.173
Regular religious attendance (%)	81.1	67.3	77.2	63.2	<0.001
Fear attack (%)	30.5	23.1	14.0	3.2	<0.001
Experienced discrimination (%)	11.6	15.9	6.8	4.8	<0.001
Veteran (%)	–	43.8	–	76.4	<0.001

Table 3

Independent life–space by ethnicity and gender (%)

	Black women	Black men	White women	White men
Limited to the room where one sleeps	24.9	20.3	11.2	12.8
Limited to within one's dwelling	8.8	5.2	3.6	5.2
Limited to space just proximal to one's living space	9.2	6.0	4.0	1.2
Limited to one's neighborhood	20.1	6.4	8.0	6.4
Limited to one's town	19.7	20.7	20.8	12.8
Extends outside one's town	17.3	41.4	52.4	65.2

$p<0.001$

Table 4

Age, education, and income by ethnicity and gender

	Black women	Black men	White women	White men	*p* value
Age (mean)	76.4	75.3	75.0	74.6	0.020
Highest level of education completed (%)					<0.001
<Sixth grade	30.1	40.2	3.6	7.6	
≥Sixth and <12th	36.1	32.7	26.4	22.4	
High school	26.5	16.7	44.0	48.4	
Technical school	0.8	3.2	7.2	3.6	
College	4.0	4.4	11.6	12.8	
Graduate	2.4	2.8	7.2	5.2	
Income (%)					<0.001
<$5000	15.3	6.8	1.5	1.8	
$5000–$7999	42.6	22.3	15.5	3.6	
$8000–$11,999	16.8	23.3	14.6	5.9	
$12,000–$15,999	11.9	14.1	11.7	12.3	
$16,000–$19,999	3.5	5.8	7.8	12.7	
$20,000–$29,999	6.4	15.5	12.6	21.8	
$30,000–$39,999	2.0	7.3	10.7	15.9	
$40,000–$49,999	1.0	1.9	7.3	10.9	
>$50,000	0.05	2.9	18.4	15.0	

Table 5

Predictors of nutritional risk

	Black women			Black men			White women			White men		
	Beta	***t***	***p* value**	**Beta**	***t***	***p* value**	**Beta**	***t***	***p* value**	**Beta**	***t***	***p* value**
Social isolation												
Live in rural area	–0.056	–0.861	0.390	0.086	1.320	0.189	0.116	1.734	0.084	0.058	0.875	0.382
Reliable transportation	0.196	2.896	0.004	0.064	1.009	0.314	0.093	1.459	0.146	0.195	2.957	0.003
Independent life–space	–0.344	–4.626	<0.001	–0.245	–3.415	0.001	–0.297	–4.121	<0.001	–0.282	–4.151	<0.001
Social support												
Married	0.050	0.704	0.482	–0.245	–3.415	0.001	–0.029	–0.376	0.707	–0.056	–0.824	0.411
Social support scale	0.086	1.343	0.181	–0.003	–0.052	0.958	0.156	2.425	0.016	–0.023	–0.346	0.730
Social capital												
Years at address	–0.043	–0.628	0.531	–0.031	–0.479	0.633	0.040	0.688	0.492	–0.084	–1.276	0.203
Religious attendance	–0.102	–1.502	0.135	–0.185	–2.781	0.006	–0.054	–0.869	0.386	–0.033	–0.487	0.627
Fear attack	–0.033	–0.479	0.632	0.143	2.300	0.023	0.056	0.953	0.342	0.009	0.136	0.892
Experienced discriminated	0.117	1.756	0.081	0.157	2.450	0.015	–0.024	–0.416	0.678	0.017	0.253	0.801
Veteran	–	–	–	–0.112	–1.664	0.098	–	–	–	0.081	1.112	0.268
Control variables												
Age	–0.058	–0.772	0.441	–0.020	–0.302	0.763	0.016	0.231	0.818	0.049	0.704	0.482
Level of education	0.040	0.517	0.606	–0.057	–0.760	0.448	–0.094	–1.288	0.199	–0.076	–1.008	0.314
Income	–0.185	–2.227	0.027	–0.112	–1.387	0.167	–0.216	–2.259	0.025	–0.155	–1.957	0.052
	R^2=0.280, F(13.553)=5.930, p<0.001			R^2=0.353, F(13.691)=7.887, p<0.001			R^2=0.387, F(13.612)=9.962, p<0.001			R^2=0.229, F(13.281)=4.576, p<0.001		