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The Effects of Social Support on Physical Functioning in Older African Americans: Longitudinal Results from the Baltimore Study of Black Aging

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Abstract

Introduction: Compared with other racial/ethnic groups, African Americans have higher rates of chronic conditions and suffer a disproportionate burden of disability. We aimed to examine the effects of social support on physical functioning among older African Americans.

Methods: We analyzed a sample of 448 urban, community-dwelling, older African Americans (aged 48 to 98 years) from the Baltimore Study of Black Aging. Baseline physical functioning was collected between 2006 and 2008 (wave 1), and change in physical functioning was collected between 2009 and 2011 (wave 2). Physical functioning was assessed by self-reported limitations in 7 activities of daily living—eating, dressing, grooming, walking, bathing, using the toilet, and transferring in and out of bed—using a binary variable to indicate whether the individual had difficulty performing each specific activity. Social support was measured by how frequently participants provided/received goods and services, financial assistance, transportation, companionship, advice, or encouragement (never [0], rarely [1], sometimes [2], frequently [3]). Negative binomial regression models were used to test the effects of social support given, received, and a ratio (support received/support given) on physical functioning for those who improved and those who declined in physical functioning.

Results: Participants reported physical functioning at wave 1 (1.24, standard deviation [SD] =1.98) and at wave 2 (0.34, SD=0.83). Average social support given was 7.49 (SD=3.26), and

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average social support received was 7.81 (SD=3.17). Those who improved in physical function gave less social support and had lower social support ratios; social support received had no effect. Those who remained stable or declined in physical function gave more social support; neither social support received nor social ratio had an effect.

Conclusion: Social support given and social support received as well as the ratio should be considered when seeking to understand how physical functioning changes over time among older African Americans.

Keywords

Disability; functional limitations; older African Americans; social support

1.1 INTRODUCTION

African Americans have higher rates of chronic conditions and suffer a disproportionate burden of disability compared with other racial/ethnic groups.^{1,2} Research suggests that race and socioeconomic status account for much of this variation in disability.³ Furthermore, psychosocial factors—such as social support—have been found to slow the disablement process among older adults.⁴ However, little research examining social support and disability among older African Americans has been reported.

In the few studies that have explored this topic,^{5–7} only two examined physical functioning over time.^{5,7} The first study, which investigated the association of structural and functional aspects of social support and change in physical function after adjusting for education and income, found no differential race effects with one exception: receipt of support (providing transportation, fixing things around the house, preparing meals) was inversely associated with physical functioning.⁷ In the second study, researchers examined the relationship between social support and onset and progression of physical disability over time.⁵ Social network presence (number of relationships and frequency of interactions with kids, relatives, or friends) was inversely associated with physical disability onset but was not associated with progression. After controlling for health status, this relationship was no longer significant; however, social engagement remained inversely associated with onset and progression of physical disability.

We sought to build on past research in two distinct ways. First, as past studies examining minority populations emphasize the importance of characterizing both giving and receiving social support as unique constructs,^{8–11} we also analyzed the exchange of these concepts as a ratio. Second, as Whitfield and colleagues argue that inadequate attention has been directed to within-group examinations when studying racial and ethnic minorities,¹² we explored the association between social support and physical functioning within groups (black participants only), whereas past studies examined this relationship between groups (non-white vs. blacks). In addition, we included the Disablement Process model,¹³ to help 1) identify the magnitude of heterogeneity within a group (e.g., older African Americans; 2) explain how meaningful social support variables contribute to the variability among older African Americans; and 3) further advance our understanding of the psychosocial aspects of aging among older African Americans and its relationship to the disablement process.

Therefore, we sought to answer the following questions: To what extent does giving social support improve physical functioning over time among older African Americans? To what extent does receiving social support worsen physical functioning over time among older African Americans? To what extent does using the social support ratio, compared with social support given and social support received, help to explain more of the variance in physical functioning over time? Lastly, using all measures of social support, is there a differential effect among older African Americans who experience improved or worsened physical functioning over time?

2.1 MATERIALS AND METHODS

2.2 Design

We conducted a retrospective longitudinal study of older African Americans and risk factors (social, demographic, medical, and economic) associated with physical functioning over time.

2.3 Study Population and Participants

This study used data from the Baltimore Study of Black Aging (BSBA), which examined cognition, health, and personality in community-dwelling older African Americans. Data were collected from 2006 to 2008 (wave 1) and from 2009 to 2011 (wave 2). At wave 1, the convenience sample included 602 community-dwelling African Americans in Baltimore, MD. At wave 2, 448 participants were still living, agreed to participate, and provided complete data. Exclusion criteria included a Mini-Mental State Examination (MMSE) score of ≤ 20 or an inability to communicate with an interviewer. All participants gave their written consent prior to enrollment. Each member received \$35 for participation. Face-to-face interviews between participants and trained investigators lasted 2.5 hours on average. Institutional review board approval was obtained from Duke University for this study.

2.4 Measures

2.4.1 Intra-individual factors—Three measures of social support were constructed: social support given, social support received, and ratio of social support given to received. Social support given was measured by how frequently participants provided goods and services, financial assistance, transportation, companionship, advice, or encouragement to their family, friends, and others (usually church members) (never [0], rarely [1], sometimes [2], frequently [3]).¹⁴ Social support received measured the frequency and type of support received using the same wording and scale. A social support ratio was calculated by dividing the measurements of social support received by social support given, with higher scores reflecting an excess in support received relative to support given.

2.4.2 Risk factors—Demographic variables included age and education in years. Chronic conditions were recorded as a sum of 8 conditions—angina, asthma, arthritis, cardiovascular disease, diabetes, stroke, heart attack, or high blood pressure—measured as ever (1) versus never (0) based on the participant having ever been told that she or he had the condition (range 0 to 8). Self-reported family income was based on participants' selection of 1 of 23 categories ranging from \$100 to \$2300 per month, in \$100 increments.

2.4.3 Physical functioning—Physical functioning was assessed by self-reported limitations in activities of daily living (ADLs). Physical functioning was assessed using a composite of 7 ADLs: eating, dressing, grooming, walking, bathing, using the toilet, and transferring in and out of bed.¹⁵ The response categories included: a) I never need help, b) I have difficulty but can do without help, c) I have difficulty and need help, and d) I never do the activity. A binary variable was created for each ADL to indicate whether the individual had difficulty performing each specific activity. After summing these 7 binary variables, a dichotomous variable for disability was created to identify those individuals who had difficulty in a least one activity.

2.4.4 Analysis—Means, standard deviations (SDs), and frequencies were calculated. The sample was subdivided according to change in physical functioning, calculated by subtracting wave 1 ADL scores from wave 2 scores. Those whose physical functioning improved (n=266, change scores = 1 to 4) were compared with those whose physical functioning remained stable or declined (n=182, change scores = -4 to 0) in bivariate analyses with independent variables and covariates. Next, a 2-stage series of negative binomial regression analyses was conducted by subgroup to estimate the significance of social support received and given and the ratio of social support at wave 1 as predictors of physical functioning at wave 2, accounting for physical functioning, demographic factors, and health conditions at wave 1. Negative binomial regression was preferred because the physical functioning variables were over-dispersed.¹⁶ Significance was set at $p<0.05$. All analyses were run using SAS version 9.3 (SAS Institute, Cary, NC).

3.1 RESULTS AND DISCUSSION

3.1.1 Results

The sample was over three-quarters female, with an average age of 69 (SD=9.19; range = 48 to 94) years (Table 1). Physical function limitations in the sample averaged 1.24 at wave 1 and 0.34 at wave 2. At wave 1, average measures of social support received and given were 7.81 and 7.49, respectively, and the average ratio of received to given was 1.14 (0.84). The average number of health conditions was 2.48.

3.1.2 Improved physical functioning—Among older African Americans who improved in physical functioning, better physical function at wave 1 was associated with a 0.27% increase in physical function at wave 2 (Table 2). Neither social support given nor social support received was an independent predictor of improved physical function at wave 2. However, the social support ratio was a significant predictor of physical functioning at wave 2. Each unit of excess social support given (relative to that received) at wave 1 was associated with a 0.54% increase in physical functioning at wave 2 (Table 3).

3.1.3 Stable or declined in physical functioning—Among older African Americans who experienced stable or declined physical functioning, both physical functioning ($p<0.001$) and social support given ($p=0.05$) at wave 1 were positively associated with stable or declined physical functioning at wave 2 (Table 2). A unit increase in physical functioning and social support given at wave 1 was associated with a 0.75% and 0.10% increase in

physical functioning at wave 2, respectively. In the full model with the social support ratio, each unit increase in physical functioning and social support given at wave 1 was associated with 0.75% and 0.11% increase in physical functioning at wave 2, respectively (Table 3).

3.2 Discussion

This paper reports the findings from a longitudinal study investigating the effects of social support on physical function over time, while controlling for covariates including demographics, income, education, and selected health conditions. Because we were interested in social support and how it might influence the direction of change in physical functioning, we divided the sample into those who reported greater physical function (fewer functional limitations) over time—improvers—and those who reported less physical function (more functional limitations) over the time—stable/decliners. We also examined the effects of the social support ratio—representing the fluid exchange of social support resources received and provided—on physical function.

3.2.1 Physical functioning at wave 1—In this study, physical functioning at wave 1 (baseline) was the strongest predictor of change in ADL functioning at wave 2 across each regression analysis. This finding was consistent with other longitudinal studies.^{5,17}

3.2.2 Social support given—Those who reported giving higher levels of support had higher physical functioning at wave 1. In our study, more social support given might be explained by greater cognitive functioning and might serve as a protective factor for ADL change. In a recent study examining the relationship between social support given and cognitive functioning among older African Americans,¹⁸ researchers posited better physical functioning might be reflective of better cognitive functioning. There is a growing body of literature examining the interactions among physical and cognitive functioning;¹⁹ however, given that most studies have examined either physical or cognitive functioning separately, their interdependence has yet to be fully understood.

3.2.3 Social support ratio—Among the older African Americans studied, those who improved in physical function had lower social support ratios. This finding suggests people who improved in physical functioning not only received less social support, but they tended to give more support than they received; however, as with all ratios, their interpretation should be discussed. Older African Americans who serve as caregivers (i.e., often giving more social support than receiving) might experience a greater burden over time, causing the giving-vs.-receiving ratio to increase.^{20–22} An increase in the ratio has implications for the caregiver as well as the care recipient. Specifically, the chronic and often progressive nature of caregiving, especially for an ailing spouse or child/grandchild, imposes a burden that undermines the health of the social support giver, thus increasing their risk for morbidity and mortality.^{23,24}

3.3 Limitations

There were several limitations of this study. First, the results of this study may not be generalizable to all older African Americans, as our participants resided in Baltimore, MD. Second, researchers did not examine the effects of specific medical conditions on physical

functioning. The association between the type of medical condition or comorbidity and physical functioning among African Americans was beyond the scope of our study. Third, this group of older African Americans were relatively robust, resulting in little ADL variability; thus, the results must be interpreted accordingly. Lastly, combining disparate items into a single measure might obscure functional differences among the group. For example, the social support measures, while useful for some purposes, do not preserve the differences between financial support and receiving advice. Such limitations, however, tend to imply that the effects of social support might be moderated by other factors and should be investigated in future research.

4.1 IMPLICATIONS

Changes in physical function can be viewed as a complex web of biological, psychological, and social factors. Development of integrated care programs (patient-centered homes)²⁵ and innovative clinical trials (e.g., Community Aging in Place, Advancing Better Living for Elders [CAPABLE])^{26,27} involving a hybrid of community development, medical, and social services should be further explored. Recognizing changes in function early in the disablement process, providing a more detailed examination of the progression of disability, and developing strategies that systematically reinforce *compensation*—adaptive changes individuals use to cope with detrimental changes to body structure, function, environment, and personal factors in an effort to maintain activity—might also offer new insights.²⁸ Older African Americans with disability, particularly those who are most disadvantaged (i.e., those experiencing social inequalities relating to poverty, low educational attainment, and housing instability),^{29,30} would seemingly be of greatest benefit.

Further research is needed to evaluate the effects of the social support ratio. It has the potential to measure an individual's ability to improve/decline in physical functioning over time. In addition, the ratio should be extended to other populations (i.e., caregivers, other minority groups), collecting representative perspectives and allowing for longer follow-up times.

In conclusion, our study reaffirms the significant relationship between social support and performing basic ADLs among older African Americans, but this relationship is conditional. Specifically, increased social support received was associated with greater disability overtime, while we found the opposite to be true of social support given. Different types of social support should be considered in future research to better understand its impact on other areas of the disablement process.

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Table 1.

Sample characteristics of older community-dwelling African Americans

Variable	Number of observations	All (N=448)	Improved from waves 1–2 (N=266)	Stable/declined from waves 1–2 (N=182)
Age, yrs	450	68.68 (9.19)	68.97 (9.54)	68.37 (8.63)
Sex	448			
Female, n (%)		344 (76.44)	0.76 (0.42)	0.76 (0.42)
Social support received	432	7.81 (3.17)	7.92 (3.21)	7.67 (3.13)
Social support given	448	7.49 (3.26)	7.19 (3.18)	7.90 (3.34)
Social support ratio ^I	432	1.14 (0.84)	1.05 (0.68)	1.26 (1.01)
Education in years	448	11.72 (2.88)	11.55 (3.02)	11.95 (2.65)
Family income ^I	434	10.54 (5.83)	10.10 (5.49)	11.24 (6.23)
Number of health conditions	448	2.48 (1.30)	2.68 (1.26)	2.20 (1.30)
ADL limitations reported				
Wave 1 ^I	448	1.24 (1.98)	2.93 (2.45)	0.25 (0.63)
Wave 2	448	0.34 (0.83)	0.48 (0.98)	0.49 (0.88)

Note: Values are means (standard deviations), unless otherwise indicated.

^ISignificant difference between improvers and stable/decliners.

Table 2.

Negative binomial regression analysis to determine the association between social support (received and given) and ADL at wave 2 among older African Americans by improvers and stable/decliners

Variable	Improvers <i>b</i> (SE)	Stable/decliners <i>b</i> (SE)
Age	0.009 (0.010)	0.029 (0.015) ¹
Sex		
Female	0.245 (0.254)	0.130 (0.338)
Social support received	−0.005 (0.034)	0.003 (0.043)
Social support given	−0.026 (0.039)	0.097 (0.038) ²
Number of health conditions	0.002 (0.073)	0.085 (0.096)
Education	0.027 (0.036)	0.025 (0.053)
Income	−0.024 (0.021)	−0.008 (0.026)
ADL limitations reported (wave 1 only)	0.275 (0.031) ³	0.747 (0.091) ³

Note. Values are coefficients (standard errors [SEs]) from regression analysis.

¹
p = 0.05

²
p < 0.05

³
p < 0.001

Table 3.

Negative binomial regression analysis to determine the association between social support (received, given, and ratio) and ADL at wave 2 among older African Americans by improvers and stable/decliners

Variable	Improvers <i>b</i> (SE)	Stable/decliners <i>b</i> (SE)
Age	0.010 (0.010)	0.029 (0.015) ¹
Sex		
Female	0.297 (0.255)	0.127 (0.338)
Social support received	0.064 (0.047)	−0.008 (0.064)
Social support given	−0.107 (0.056) ¹	0.105 (0.048) ²
Social support ratio	0.540 (0.260) ²	−0.060 (0.234)
Number of health conditions	0.017 (0.073)	0.084 (0.096)
Education	0.028 (0.036)	0.024 (0.053)
Income	−0.024 (0.021)	−0.007 (0.026)
ADL limitations reported (wave 1 only)	0.271 (0.026) ³	0.748 (0.091) ³

Note. Values are coefficients (standard errors [SEs]) from regression analysis.

¹
p = 0.05

²
p < 0.05

³
p < 0.001