

SOCIAL SUPPORT AND CARDIOVASCULAR RISK FACTORS AMONG BLACK ADULTS

Objective: Cardiovascular disease (CVD) risk factors are prevalent among Black adults. Studies have demonstrated that functional social support buffers CVD risk. The objective of our study is to assess whether specific types of functional social support or their cumulative total buffers CVD risk factors among a convenience sample of Black adults, and whether these associations differ by sex or partner status.

Design: Cross-sectional study using self-reported survey data.

Setting: Large church in Houston, TX.

Participants: A total of 1,381 Black adults reported their perceived social support using appraisal, belonging, and tangible subscales of the Interpersonal Support Evaluation List-12. A cumulative score was created based on the three subscales. Participants also reported on a number of sociodemographic characteristics.

Main Outcome Measures: Three self-reported CVD risk factors: diabetes, high blood pressure, and high cholesterol (yes vs no).

Results: A series of multivariate logistic regressions controlling for sociodemographic characteristics were used to calculate adjusted odds ratios (aOR) and 95% confidence intervals (CI) for CVD risk factors. Cumulative social support, rather than any specific type of social support, was significantly related to diabetes and high blood pressure. Higher cumulative social support was associated with lower odds of experiencing diabetes (aOR=.97, 95% CI=.94, .99) and high blood pressure (aOR=.98, 95% CI=.95, .99). Neither sex nor partner status moderated associations.

Conclusion: In a high risk population for CVD, increasing all types of social support - appraisal, belonging, and tangible - might be useful in preventing or delaying the onset of CVD. (*Ethn Dis.* 2014;24[4]:444-450)

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INTRODUCTION

In 2009 cardiovascular disease (CVD) was the leading cause of death for adult Black males and females.¹ Adult Black males and females have higher prevalence rates of high blood pressure (42.6% and 47.0%, respectively) and diabetes (13.5% and 15.4%, respectively) compared to adult White males (33.4% blood pressure; 7.7% diabetes), White females (30.7%; 6.2%), Mexican American males (30.1%; 11.4%), and Mexican American females (28.8%; 12.0%).² Further, the prevalence of high blood pressure among US Black adults is among the highest in the world.² The disparities observed in CVD risk factors are also related to differences to the onset of the disease. Black individuals develop high blood pressure earlier in life compared to White individuals, which places them at greater risk for experiencing a stroke at a younger age.²

Perceived social support may affect the development and course of CVD and its associated risk factors (eg, high blood pressure, diabetes).³⁻⁹ Specifically, social support theory suggests that social support serves as a buffer to prevent or reduce the harmful longer-term health effects associated with encountering undesirable and traumatic events.¹⁰ There has been a significant

amount of research that has applied this theoretical framework demonstrating that social support serves as a buffer for high blood pressure and overall reduces the development and mortality rates related to CVD.³⁻⁷ For instance, research on primarily White samples suggests that appraisal support is beneficial for blood pressure,⁸ and the lack of tangible support is related to coronary artery disease.⁹ Social support might be a particularly salient factor for middle-aged Black adults with regard to CVD risk factors. This is because Black families have relied on extended family and informal networks as a source of social support for decades due to cultural, social, and economic factors.¹¹

Although the association between social support and multiple CVD risk factors has not been investigated previously among large samples of middle-aged Black adults,^{8,9} perceived social support has been associated with a variety of other physical and psychological health outcomes among this group. For instance, greater social support has served as a moderator between optimism and well-being, psychological distress and psychosocial functioning among a sample of Black breast-cancer patients.¹² Social support has also been found to lessen the psychological distress associated with perceived discrimination among Blacks.¹³ The positive association between social support and various health outcomes may reflect that social support facilitates engagement in health promoting behaviors such as exercise, healthy eating, and avoidance of tobacco use and alcohol abuse, as well as greater adherence to medical recommendations.^{14,15}

Social support is typically measured in terms of structural support and functional support. Structural support refers to the network of people surrounding the individual, along with the

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interactions the individual has with people in the network. Functional support refers to the type of support the individual receives from the network. Types of functional support include appraisal (eg, help evaluating a situation), belonging (eg, companionship), and tangible (eg, help getting tasks completed) support. Although functional social support is commonly assessed in the literature, it is unclear whether appraisal, belonging, or tangible support is most associated with reduced CVD risk factors among Blacks. At the same time, application of cumulative theory^{16,17} suggests that it is not a particular type of functional social support that is associated with not experiencing CVD risk factors, but instead it is the aggregate of the various types of functional social support.

Social support can also vary by sex and partnership status. Women tend to have larger social networks and are more likely to seek out social support during times of distress as compared to men.^{18,19} Further, marriage is a form of structural support that has been associated with a variety of health benefits, such as better self-rated health,²⁰ mental health,^{21,22} and less alcohol abuse and participation in risk-taking activities.²³ Further, being married has been associated with a lower risk of out-of-hospital sudden cardiac arrest among older adults.²⁴ On the other hand, single living has been associated with double the risk of death after acute myocardial infarction.²⁵ Thus, the benefits of social support on CVD risk factors may be more relevant to women than men, and to individuals that are married or living with a partner, as compared to single individuals.

Using cross-sectional data, our study examined the association between social support and CVD risk factors among a community-based sample of middle-aged Black adults. This study contributes to the literature by investigating whether a particular type of functional social support – appraisal, belonging,

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tangible – was associated with not experiencing diabetes, high blood pressures, or high cholesterol, or whether the cumulative total of social support yielded a stronger association. Further, the study also assessed whether the association between social support and CVD risk factors was moderated by sex or partner status.

METHODS

Design and Sample

Data were from a study designed to delineate aspects associated with health risk factors among Black adults. Participants comprised a convenience sample recruited via televised media and in-person solicitation from a large church in Houston, Texas. Participants were required to be ≥ 18 years old, residents of the Houston area with a functional telephone number, and church attendees. Data from 1467 participants were collected between December 2008 and July 2009. Surveys were completed in person at the church, and participants were compensated with a \$30 gift card. Study procedures were approved by the IRB at the University of Texas MD Anderson Cancer Center (Houston), and informed consent was obtained from all participants prior to data collection.

Only participants with complete data on the measures described below ($N=1381$) were included in our study.

Adults in the analytic sample were more likely than adults excluded from the analytic sample ($n=86$) to have high cholesterol, be older, be female, have a Bachelor's or Master's degree, be employed, have private health insurance, and less likely to have incomes $< \$40,000$. There were no differences in the proportion of adults who experienced diabetes or high blood pressure between adults in the analytic sample and those excluded from the analytic sample.

Measures

Cardiovascular Risk Factors

Self-reported diabetes, high blood pressure, and high cholesterol were each assessed by items beginning with: "Please indicate if you have had any of the following medical problems..." (yes vs no).

Social Support Variables

The perceived availability of social support across a variety of situations was measured using the 12-item Interpersonal Support Evaluation List (ISEL).²⁶ The ISEL has three subscales representing discrete functions of social support: appraisal, belonging, and tangible.²⁶ Appraisal support items assess the availability of someone to talk with about problems and include: "I feel that there is no one I can share my most private worries and fears with," and "If a family crisis arose, it would be difficult to find someone who could give me good advice about how to handle it." Belonging support items assess the availability of people with whom one can do activities and include: "I don't often get invited to do things with others," and "If I wanted to have lunch with someone, I could easily find someone to join me." (item was reverse scored). Tangible support items assess instrumental aid and include: "If I were sick, I could easily find someone to help me with my daily chores," (item was reverse scored) and "If I needed some

help in moving to a new house or apartment, I would have a hard time finding someone to help me.” Response options for each item were as follows: 1=definitely true, 2=probably true, 3=probably false, and 4=definitely false. Scores on each subscale could range from 4 to 16, with higher scores indicative of greater social support. Cronbach’s alpha for the subscales ranged from .68 to .71.

In addition to the three subscales, responses to items on the ISEL were summed to represent a cumulative social support score (ISEL total). Total scores could range from 12 to 48, with higher scores indicative of greater social support. Cronbach’s alpha for the ISEL total in this sample was .84.

Statistical Analyses

Analyses were performed using STATA statistical software version 10.0 (StataCorp, College Station, Tex.). Descriptive statistics were conducted to examine participant characteristics. For each of the three dichotomous dependent variables, a series of multivariate logistic regression models were conducted. In the first set of regression models, the dependent variable was regressed onto the three ISEL subscales. In the second set of regression models, the dependent variable was regressed onto the ISEL total score. The third and fourth set of models included a series of regressions that included a product term interacting with each of the three ISEL subscales and sex and the ISEL total score and sex, respectively. The fifth and sixth set of models included a series of regressions that included a product term interacting with the three ISEL subscales and partner status and the ISEL total score and partner status, respectively. All sets of regression models included the following socio-demographic covariates: age, sex, partner status, education, employment, total annual household income, and health insurance.

RESULTS

Mean age of participants was 45.7 (SD=12.4) years and predominately female (76%) (Table 1). Approximately 43% of participants were married/living with a partner, 50% had a bachelor’s degree or more advanced education, 75% were employed, 75% reported an annual household income of \geq \$40,000, and 68% reported private health insurance. Eleven percent of participants reported having diabetes, 39% reported having high blood pressure, and 27% reported having high cholesterol. In this sample, participants reported high levels of appraisal support (mean=14.0; SD=2.42), belonging support (mean=13.3; SD=2.58), and tangible support (mean=13.8; SD=2.31), which resulted in high levels of cumulative social support (mean=41.1; SD=6.17).

Males (mean=13.57) reported higher levels of belonging support compared to females (mean=13.22; $P<.05$). In addition, a greater percentage of married/partnered individuals (13%) reported having diabetes compared to single individuals (9%; $P<.01$). Married/partnered individuals reported higher levels of belonging support (mean=13.81 vs 12.91; $P<.001$), tangible support (mean=14.09 vs 13.60; $P<.001$), and cumulative social support (mean=42.02 vs 40.41; $P<.01$) compared to single individuals.

Results from the multivariate logistic regression models indicated that none of the three types of functional social support – appraisal, belonging, tangible – were significantly related to CVD risk factors (Table 2, Model 1 for all 3 outcomes). However, adults with high levels of cumulative social support were at 3% lower odds of experiencing diabetes [adjusted odd ratio (aOR)=.97, 95% CI=.94, .99] and 2% lower odds of experiencing high blood pressure (aOR=.98, 95% CI=.95, .99), respectively (Table 2, Model 2 for diabetes and high blood pressure). High levels of cumulative social support were

not related to high cholesterol. Neither sex nor partner status moderated the relationship between cumulative social support and the three CVD risk factors (results not shown; $P>.05$).

DISCUSSION

Previous studies examining the association between social support and CVD risk factors have primarily focused on White samples using a single type of social support (rather than a number of different types of social support).^{8,9} Our study addressed this gap by investigating which type of support – appraisal, belonging, and tangible – was most associated with reduced odds of reporting CVD risk factors among middle-aged Black adults. Our findings suggest that it was not a discrete type of social support alone that was associated with CVD risk factors, but rather an aggregate of the various types of functional social support that was most important in middle-aged Black adults reporting diabetes and high blood pressure. These results coincide with social support theory¹⁰ and cumulative theory^{16,17} and suggest the potential relevance of interventions targeting the development or enhancement of all types of social support – appraisal, belonging, and tangible – in order to potentially mitigate CVD risk among Black adults.

Although significant relationships were found between cumulative social support and: 1) diabetes, and 2) high blood pressure, the odds ratios were relatively small. The small odds ratios may be related to the fact that the study was based on a cross-sectional sample of relatively healthy, socio-economically advantaged, primarily female, Black adults experiencing generally high levels of social support. Among healthy individuals, structural support is associated with better health, whereas functional social support is expected to be more effective after illness.³ As the participant’s age and the risk for CVD

Table 1. Cardiovascular risk factors, social support and sociodemographic characteristics of Black study participants and by sex and partnership status, N = 1381^a

Characteristics	Full Analytic Sample	Sex		Partnership Status	
		Female	Male	Married/Partnered	Single
Cardiovascular risk factors					
Diabetes	11	10	12	13	9 ^e
High blood pressure	39	38	41	41	37
High cholesterol	27	27	29	32	23
Social support					
Appraisal	14.00 (2.42)	14.07 (2.43)	13.77 (2.40)	14.12 (2.35)	13.90 (2.48)
Belonging	13.31 (2.58)	13.22 (2.65)	13.57 (2.33) ^f	13.81 (2.31)	12.91 (2.70) ^d
Tangible	13.82 (2.31)	13.85 (2.38)	13.72 (2.12)	14.09 (2.11)	13.60 (2.44) ^d
Cumulative social support	41.12 (6.17)	41.14 (6.28)	41.06 (5.81)	42.02 (5.67)	40.41 (6.45) ^e
Sociodemographic characteristics					
Age, years	45.66 (12.41)	45.90 (12.10)	44.91 (13.30)	47.99 (10.99)	43.82 (13.14) ^d
Female	76	100	–	65	84 ^d
Partner Status					
Single/widowed/divorced ^b	56	62	37 ^d	–	100
Married/living with partner ^c	44	38	63 ^d	100	–
Education, %					
<Bachelor's	50	48	55 ^f	48	52
Bachelor's	30	30	30	30	30
≥Master's	20	21	15	22	18
Employed, %					
Employed, %	75	74	78	78	74
Annual household income					
≤\$39,999	25	27	18 ^e	10	37 ^d
\$40,000–\$79,999	40	41	37	36	43 ^e
≥\$80,000	35	32	45 ^d	55	20 ^d
Health insurance					
Private	68	70	63 ^e	76	63 ^d
Public	17	15	23 ^d	15	19
No insurance	15	15	14	10	19 ^d

^a Data are mean (SD) or %.

^b 57% single; 6% widowed; 37% divorced.

^c 96% married; 4% living with partner.

^d $P < .001$.

^e $P < .01$.

^f $P < .05$.

increase, it would be important to examine the longitudinal association between the three types of functional social support and the cumulative total of social support on CVD risk factors. It is certainly possible that the discrete types of functional social support may have varying roles in CVD risk factors when examined over time. That significant cross-sectional associations were found even within a relatively healthy sample of Black adults experiencing the social support inherent in a church community speaks to the potential importance of future studies assessing

the impact of social support on cardiovascular health among a broader sample Black adults.

Despite prior research suggesting that women have larger social support networks compared to men^{18,19} and that there are greater health benefits to being married compared to being single,^{20–24} neither sex nor partner status were significant moderators of the relationship between social support and CVD risk factors in our sample. The lack of significant findings could be related to the fact that participants comprised a community-based sample

who attended a large church. Church attendance may provide a substantial network of individuals that can provide support, which may not differ by sex or partner status. Previous research has suggested that simply having access to support (and not necessary acting upon the support network) benefits cardiovascular health.²⁷ Thus, access to a substantial network of individuals with similar beliefs may have contributed to a homogenous sample in this regard. Future studies might examine how sex and partner status affect relations between social support and CVD risk

Table 2. Adjusted odds ratios (95% confidence intervals) for associations between social support and various cardiovascular risk factors among Black study participants, N = 1381

	Diabetes		High Blood Pressure		High Cholesterol	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
Social support						
Appraisal	.97 (.88–1.06)	—	1.03 (.96–1.09)	—	1.04 (.98–1.12)	—
Belonging	.91 (.83–1.00)	—	.95 (.89–1.01)	—	.99 (.93–1.06)	—
Tangible	1.03 (.93–1.14)	—	.95 (.89–1.02)	—	1.00 (.93–1.07)	—
Cumulative social support	—	.97 ^c (.94–.99)	—	.98 ^c (.95–.99)	—	1.01 (.99–1.03)
Sociodemographic characteristics						
Age	1.08 ^a (1.05–1.10)	1.08 ^a (1.06–1.10)	1.07 ^a (1.06–1.09)	1.07 ^a (1.06–1.09)	1.05 ^a (1.04–1.06)	1.05 ^a (1.04–1.06)
Female	.91 (.58–1.42)	.94 (.60–1.47)	.88 (.62–1.10)	.84 (.63–1.12)	.91 (.67–1.23)	.92 (.68–1.24)
Partner status						
Single/widowed/divorced	Reference	Reference	Reference	Reference	Reference	Reference
Married/living with partner	1.85 ^b (1.20–2.84)	1.79 ^b (1.17–2.74)	.93 (.71–1.22)	.91 (.69–1.19)	1.34 ^c (1.01–1.78)	1.32 (1.00–1.75)
Education						
<Bachelor's	Reference	Reference	Reference	Reference	Reference	Reference
Bachelor's	.37 ^a (.23–.61)	.38 ^a (.23–.62)	.68 ^b (.51–.90)	.69 ^c (.52–.91)	1.14 (.84–1.53)	1.15 (.85–1.54)
≥Master's degree	.46 ^b (.26–.79)	.47 ^a (.27–.81)	.61 ^b (.43–.85)	.62 ^b (.44–.86)	1.22 (.87–1.73)	1.23 (.88–1.74)
Employed						
	1.00 (.64–1.57)	1.00 (.64–1.57)	.99 (.72–1.34)	.99 (.73–1.35)	1.10 (.79–1.53)	1.10 (.79–1.54)
Annual household income						
≤\$39,999	1.07 (.65–1.75)	1.03 (.63–1.68)	.94 (.68–1.31)	.92 (.66–1.29)	.77 (.53–1.11)	.76 (.53–1.10)
\$40,000–\$79,999	Reference	Reference	Reference	Reference	Reference	Reference
≥\$80,000	.60 ^c (.37–.97)	.60 ^c (.37–.97)	1.00 (.75–1.34)	.99 (.74–1.33)	.79 (.58–1.06)	.78 (.58–1.06)
Health Insurance						
Private	Reference	Reference	Reference	Reference	Reference	Reference
Public	1.15 (.69–1.88)	1.15 (.70–1.89)	1.16 (.81–1.66)	1.18 (.82–1.68)	1.09 (.76–1.59)	1.10 (.76–1.60)
No insurance	.88 (.47–1.64)	.89 (.48–1.65)	.96 (.66–1.40)	.98 (.67–1.43)	.77 (.50–1.19)	.78 (.51–1.20)

^a P < .001.

^b P < .01.

^c P < .05.

factors among a more socioeconomically diverse, non-church-based Black sample to determine if results replicate.

In our sample, social support was not significantly related to high cholesterol, whereas social support was significantly related to the other CVD risk factors. It is possible that the significant findings

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reflect greater awareness placed on measuring blood pressure and blood sugar levels compared to measuring cholesterol. For instance, pharmacies and clinics have made blood pressure devices free and open to the public for patrons to monitor their blood pressure at will. Community health fairs provided within the church setting and elsewhere provide additional opportunities for attendees to become aware of their blood pressure and blood sugar levels. In addition, there are inexpensive medical supplies that allow individuals to monitor their blood pressure and blood sugar levels. The availability of the supplies draws more attention and promotes health behaviors associated with lowering blood pressure and blood sugar levels.

For Black adults who perceive lower levels of social support, our study

underscores the importance of developing avenues to increase social support, as support availability may help to buffer CVD risk. This may entail a greater involvement in family, church, social, or community activities in order to build a supportive social network. Church ministry groups may wish to assess attendees' perceived social support, and promote social connections that facilitate all types of functional social support through directed activities and events. Clinicians are recommended to ask their patients at risk of diabetes and high blood pressure about their social network, and emphasize the importance of building and maintaining social support structures on cardiovascular health. Finally, intervention programs aimed at reducing CVD risk factors need to take into account that it is not one

particular type of social support but an aggregate of the types of social support that help reduce CVD risk factors.

While our current study benefitted from several strengths, including a large sample size and the assessment of multiple types of social support, there were several weaknesses that should be considered in the interpretation of results. Given the cross-sectional nature of the study, causation cannot be inferred. It is not clear whether the individuals that self-reported a diagnosis later sought out social support as a result of the diagnosis or whether individuals with a larger social support network are more inclined to engage in health promoting behaviors and seek out medical advice. Further, our study draws its participants from a large church located in a metropolitan southern US city that is attended primarily by Black individuals; thus, the results may not be generalized to other church attendees or to non-church attendees. Further, the study participants were Black and primarily female; thus, the results may not generalize to other racial/ethnic groups and may be more relevant to women. Yet, there are benefits to investigating the relationship between social support and CVD risk factors among a Black sample. By solely focusing on middle-aged Black adults, the confounding factors of age and race are removed. Further, because 55% of Black adults regularly attend church,²⁸ our study could be relevant to the Black community.

CONCLUSION

In summary, our findings contribute to the understanding of the health determinants of Black adults. Specifically, our study indicates that the aggregate of three types of functional social support is associated with adults not reporting diabetes and high blood pressure among a sample of middle-aged Black adults. Results also suggest that having access to

a substantial network of individuals with similar beliefs may provide support that does not differ based on sex or partner status. Because Black adults are a high risk sub-population for CVD, increasing all types of social support - appraisal, belonging, and tangible - might be useful in preventing or delaying the onset of CVD.

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