Social Engagement and All-Cause Mortality: A Focus on Participants of the Minority Aging Research Study

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Introduction: Social engagement is known to improve health; less is known about whether social activities at the core of African American life decrease mortality risk in this minoritized population. This study investigated whether and which aspects of social engagement predict mortality risk in older African Americans.

Methods: Data from 768 African Americans (aged ≥73 years; nondemented at baseline) participating in the Minority Aging Research Study, a longitudinal community-based, cohort study of aging, was collected between 2004 and 2020 and analyzed in 2020. Participants self-reported late-life social activity, social network size, life space, and purpose in life at baseline and completed approximately 6.5 years of annual follow-up (range=15.70). Cox models included time from baseline to death or censoring and an indicator for death versus censored with age, sex, education, cardiovascular disease risk factor burden, depressive symptomatology, and motor gait performance as covariates.

Results: As of March 2020, 25% of participants died (n=192; age at death ≥83 years). In fully adjusted Cox models, mortality risk decreased by 34% (hazard ratio=0.66; 95% CI=0.48, 0.91; p=0.012) for those with higher compared with that for those with lower social activity generally, with community/volunteer-, group-, and socially-related activities specifically driving these results.

Conclusions: Engaging in late-life social activity, especially group- and socially-based activities, was most consistently and robustly associated with reduced mortality risk in African Americans regardless of health. These results lay the foundation for considering community-based approaches to increase and/or maintain social participation in older African Americans as a potential means by which to increase longevity in this population.


INTRODUCTION

Growing evidence suggests that efforts to encourage greater social participation and connectedness among aging populations are not only possible1 but may improve older adults’ overall health.2,3 Despite this, less is known about the role of social engagement on mortality risk and/or which types of social engagement1 are most protective. Across Europe,5–7 the Middle East,8 and the Americas9–11 stronger social ties and greater social engagement in activities, including but not limited to religious activities,5,12 church attendance,10,11 and volunteerism,2,13,14 have been associated with lower mortality in older adults. Although these studies provide a global foundation regarding the role of select aspects of social engagement on mortality risk, most but not all11 comprise predominantly (≥85%), if not exclusively, older
White adults.\textsuperscript{2,13,14} Thus, there remain knowledge gaps regarding how social engagement, including specific social activities at the center of African American life in the U.S., may decrease mortality risk in this minoritized population.

In addition to church participation, involvement in fraternities, sororities, and/or other community-based organizations are at the core of the lived experience of African Americans in the U.S.\textsuperscript{15} Despite this, little to no work has examined whether social engagement, generally or by type, reduces the risk of mortality in older African Americans. This study investigated aspects of late-life social engagement as related to mortality risk in older African Americans in the Minority Aging Research Study (MARS) using data collected between 2004 and 2020 and analyzed in 2020.

\textbf{METHODS}

The IRB of Rush University Medical Center approved this study, and participants gave written informed consent for all study procedures in accordance with the Declaration of Helsinki.

\textbf{Study Sample}

MARS,\textsuperscript{16} begun in 2004, is an ongoing longitudinal community-based, cohort study of aging in African Americans. As described elsewhere,\textsuperscript{16} participants are recruited from a variety of community-based settings that cater to older African Americans in the metropolitan Chicago area and outlying suburbs, enroll without known dementia, and agree to detailed annual evaluations. At the time of these analyses, data were available for 787 MARS participants; 19 had dementia\textsuperscript{17} at the time of their baseline evaluation, that is, study baseline, and participants had complete social engagement and vital status data required for longitudinal analyses and a mean follow-up time of 4.61 years.

\textbf{Measures}

To capture aspects of late-life social engagement, participants were queried at their first study evaluation, that is, study baseline, for levels of social activity, social network size, life space, and purpose in life. Specific details of each social engagement scales used are outlined below.

The frequency of late-life social activity was assessed using a version of a social resources scale modified for older African Americans that assesses how often, during the past year, participants engaged in 8 common types of social interactions.\textsuperscript{19} These activities, rated on a 5-point scale from 1 (every day or almost every day) to 5 (once a year or less), included going to restaurants or sporting events, taking day or overnight trips, doing unpaid community/volunteer work, visiting relatives’ or friends’ homes, participating in any groups (such as senior center and church-related, charity, public service, or community groups), attending church or religious services (conceived of as distinct from extra-curricular church-related activities), shopping with friends, and going to parties or other social events (e.g., senior dances, night-clubs). Responses were inverted and summed so that a higher score reflected higher levels of social activity.

A measure of social network size was derived from standard questions about the total number of children, family, and friends each participant has and how often they interact with them. The score represented the number of these individuals seen at least once a month (higher score=larger network size).\textsuperscript{20}

Using a modified version of the Life Space Questionnaire,\textsuperscript{21} a composite measure of spatial movement was derived on the basis of participant reports of having been (or not been) in 6 specific zones of the environment, including the bedroom, porch/patio, yard, inside and outside of the neighborhood, and outside of town in the past week. The sum of all responses (1=yes, 0=no) indicated life space; a higher score represented a larger life space.

Purpose in life was assessed using a modified 10-item version of Ryff’s and Keye’s Psychological Well-Being scale.\textsuperscript{22} Participants are asked to rate their level of agreement with statements such as I enjoy making plans for the future and working them to a reality using a 5-point scale from strongly disagree to strongly agree; item scores were flipped (as relevant) and averaged to yield a total score (maximum=5), with higher scores indicating greater purpose.\textsuperscript{23}

Determination of vital status is conducted for MARS participants such that for those who signed an Anatomical Gift Act and subsequently came to autopsy (n=44), the exact date of death is known. In all other MARS participants, in addition to annual evaluations, they are contacted quarterly to determine vital status and changes in health. Thus, death is learned of during these quarterly contacts and confirmed by documentation from family or other contacts. Finally, research assistants regularly search the Social Security Death Index and social media accounts for the small number of participants lost to follow-up.

In addition to age, sex, and years of education, additional covariates included cardiovascular disease (CVD) risk factor burden, depressive symptomatology, and motor gait performance. Each confounder was assessed at the study baseline and is known to be associated with social engagement as well as mortality (e.g.,\textsuperscript{23–25}). CVD risk factor burden was derived using self-report questions probing the presence or absence of hypertension, diabetes, or smoking. As previously described,\textsuperscript{26} each item was given a value of 1 or 0 with the cumulative CVD risk factor burden score ranging from 0 to 3. Depressive symptomatology was assessed with a 10-item version\textsuperscript{27} of the Center for Epidemiologic Studies of Depression scale. Participants were asked whether or not they experienced each of the 10 symptoms much of the time in the past week; scores reflected the total number of symptoms experienced (maximum=10). Motor gait represents a composite measure of time (in seconds) and the number of steps (reciprocated, i.e., 1/original value) required to walk a distance of 8 feet twice and to turn 360° twice, with larger values indicating less time and fewer steps.\textsuperscript{28} Values of each trial are averaged to obtain 4 scores (walking time, walking steps, turning time, turning steps) that are then converted to individual z-scores and averaged.

\textbf{Statistical Analysis}

Descriptive summaries of all variables at the study baseline, including covariates, were conducted, and crude associations were examined. Cox proportional hazard models examined the
The relationship between individual measures of late-life social engagement (i.e., social activity, social network size, life space, and purpose in life) and mortality; model assumptions were verified by examining the correlation of the Schoenfeld residuals with the ranked survival time and the cumulative martingale residuals versus simulated from the null distribution.\textsuperscript{10,11,14} Missing data were not imputed, instead models allowed for listwise deletion as relevant. Analyses were programmed in SAS/STAT software, version 9.4 of the SAS System for Linux (SAS Institute, Cary, NC). Statistical significance was considered using 95% CIs and \(p<0.05\).

### RESULTS

Participants were, on average, aged 73 years at baseline, reported approximately 15 years of education, and were primarily female (76.9%). The average CVD risk factor burden was 1.5 of a possible 3, and the average depressive symptomatology was 1.3 (of a maximum score of 10) and was considered low. Table 1 has more specific information on these and other variables.

In terms of our specific predictors, participants reported participating in late-life social activities, on average, at least several times a year and having an average social network size of 6.44±6.00. Life space was, on average, large (5.5 of a maximum score of 6), and purpose in life was relatively high (3.8 of a maximum score of 5) (Table 1).

Higher levels of social activities were correlated with lower baseline age (\(r=-0.147, p<0.0001\)) and depressive symptomatology (\(r=-0.118, p=0.0011\)) as well as higher levels of education (\(r=0.205, p<0.0001\)) and motor gait performance (\(r=0.223, p<0.0001\)). A similar profile of correlations was seen for life space (\(p\leq0.0012\)) and purpose in life (\(p<0.0001\)), whereas higher purpose in life was also negatively correlated with CVD risk factor burden (\(r=-0.078, p=0.030\)). Higher social network size was correlated with lower depressive symptomatology only (\(r=-0.172, p<0.0001\)). Women reported higher levels of late-life social activities than men, \(t(765)=3.43\) (95% CI=−0.48, 0.53), \(p=0.0006\), whereas men reported larger social networks than women, \(t(762)=−3.38\) (95% CI=−2.74, −0.73), \(p=0.0008\). There was no sex difference in life space or purpose in life (\(p\geq0.17\)). All social engagement measures were significantly correlated with each other (Appendix, available online, provides details).

There were 192 deaths (25% of the analytic sample) over a mean of 6.5 years of follow-up time. The average age at death was approximately 83 years.

After adjustment for age, sex, education, CVD risk factor burden, and depressive symptomatology (Table 2), both social activity and life space were significantly associated with mortality risk (\(p\leq0.021\)). Specifically, each

### Table 1. Participant Characteristics

<table>
<thead>
<tr>
<th>Demographics</th>
<th>N(=768)</th>
</tr>
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<tbody>
<tr>
<td>Age, years</td>
<td>73.46 ± 6.30</td>
</tr>
<tr>
<td>Sex, male:female</td>
<td>177:591</td>
</tr>
<tr>
<td>Education, years</td>
<td>14.85 ± 3.44</td>
</tr>
<tr>
<td>Predictors and outcomes</td>
<td></td>
</tr>
<tr>
<td>Late-life social activity</td>
<td>2.54 ± 0.51</td>
</tr>
<tr>
<td>Purpose in life</td>
<td>3.86 ± 0.45</td>
</tr>
<tr>
<td>Life space</td>
<td>5.53 ± 0.87</td>
</tr>
<tr>
<td>Social network size</td>
<td>6.44 ± 6.00</td>
</tr>
<tr>
<td>Mortality, n (% present)</td>
<td>192 (25.0)</td>
</tr>
<tr>
<td>Age at death</td>
<td>82.84 ± 7.58</td>
</tr>
<tr>
<td>Covariates</td>
<td></td>
</tr>
<tr>
<td>CVD risk factor burden</td>
<td>1.54 ± 0.86</td>
</tr>
<tr>
<td>Depressive symptomatology</td>
<td>1.32 ± 1.72</td>
</tr>
<tr>
<td>Motor gait</td>
<td>1.00 ± 0.22</td>
</tr>
</tbody>
</table>

Note: Values are mean ± SD unless otherwise noted. Depressive symptomatology was measured using the Center for Epidemiologic Studies of Depression.

CVD, cardiovascular disease.

### Table 2. Results of Cox Proportional Hazard Models for Baseline Late-Life Social Engagement and Mortality

<table>
<thead>
<tr>
<th>Model terms</th>
<th>Social activity</th>
<th>Social network size</th>
<th>Life space</th>
<th>Purpose in life</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model 1: age, sex, education, CVD risk factor burden, and depressive symptomatology</td>
<td>0.625 (0.460, 0.848) p=0.002</td>
<td>0.991 (0.953, 1.041) p=0.485</td>
<td>0.865 (0.765, 0.979) p=0.021</td>
<td>0.806 (0.555, 1.170) p=0.258</td>
</tr>
<tr>
<td>Fully adjusted Model 2:</td>
<td>0.663 (0.480, 0.915) p=0.012</td>
<td>0.993 (0.971, 1.015) p=0.534</td>
<td>0.881 (0.769, 1.010) p=0.070</td>
<td>0.869 (0.596, 1.267) p=0.466</td>
</tr>
</tbody>
</table>

Note: Boldface indicates statistical significance using 95% CI (\(p<0.05\)). Values are reported as hazard ratios (95% CIs) and \(p\)-values.

CVD, cardiovascular disease.
additional point on the late-life social activity scale conferred roughly a 36% decrease in risk of death; likewise, each additional zone of the environment a participant reported having been in conferred a roughly 14% decrease in risk of death. Additional adjustment for motor gait performance as a final covariate did not change the results for social activity (Figure 1 shows adjusted survival curves); however, results related to life space were no longer significant (Table 2). Regardless of model adjustments, none of the other social engagement metrics, including social network size, life space, or purpose in life, were significantly associated with mortality risk (Table 2).

Given the robust nature of the association between overall levels of social activity and reduced risk of mortality, the 8 items that comprised the overall late-life social activity score were considered as individual predictors in separate models. After adjustment for age, sex, education, CVD risk factor burden, and depressively symptomatology (Table 3), 3 of the 8 late-life social activity questions were associated with anywhere between 13% and 21% reduction in mortality risk ($p \leq 0.032$). The 3 specific late-life social activities were (1) doing community or volunteer work, (2) participating in groups (such as senior centers and church-related, charities, public service, and/or community groups), and (3) going to parties or other social events. Although a fourth question about visiting at relatives’ or friends’ houses was associated with reduced mortality risk (Table 3), this association did not reach the threshold for significance ($p=0.054$). After further adjustment for motor gait performance, 2 of the 3 social activities, that is, participating in groups and going to parties or other social events, remained significantly associated with mortality ($p \leq 0.037$). No other individual social activities were significant after this final adjustment (Table 3).

**DISCUSSION**

This study of more than 750 older African Americans investigated aspects of late-life social engagement as related to mortality risk. Results suggested that higher levels of late-life social activity (but not social network size, life space, or purpose in life) predicted reduced mortality risk in older African Americans regardless of other demographic, CVD, and psychosocial-related factors. This was particularly true for activities that involved unpaid community/volunteer work; participation in groups such as senior centers and church-related, charities, public service, and/or community groups; or going to parties and other social events. Furthermore, participating in any groups and going to parties or other social events continued to be associated with a lower risk of mortality after final adjustment for motor gait.
The Lancet Commission highlighted the importance of late-life social engagement, indicating that it adds to the growing body of literature addressing this protective factor for health. First, with its focus on aspects of late-life social engagement, it contributes to the dearth of critical empirically based insights regarding the key aspects of late-life social activities that may decrease mortality for older African Americans, including activities that are central to the lived experiences of African Americans in the U.S. In fact, several of the organizational activities associated with reduced mortality in this study have historically been a critical source of strength and support within the African American community because these community members have leveraged many of the same organizations and social ties to find strength and mobilize against experiences of systemic racism and discrimination in the U.S. It follows that recently proposed pathways linking social engagement to health—specifically, the role of bonding ties, that is, a network of close ties and meaningful social roles—should be explored within the African American population. In fact, more work in general is needed within race and/or ethnicity if the field is to sufficiently promote culturally compatible activity-based interventions to reduce mortality risk within diverse communities.

Although certain activities at the core of the lived experience of African Americans (e.g., participation in church-related and other community-based groups) decreased mortality risk in this study, it should be noted that it was not attending church or religious services alone that decreased risk but active participation in any groups, including (but not limited to) church-related groups. Likewise, it was not the theoretical construct of purpose in life but actual purposeful activities and interactions that decreased mortality risk in this study, it should be noted that it was not attending church or religious services alone that decreased risk but active participation in any groups, including (but not limited to) church-related groups. Likewise, it was not the theoretical construct of purpose in life but actual purposeful activities and interactions. This is in keeping with some but not all studies investigating these issues as related to mortality risk. Mixed results may be due, in part, to the make-up of the populations studied, including the highly secularized experiences of African Americans in the U.S. In fact, more work in general is needed within race and/or ethnicity if the field is to sufficiently promote culturally compatible activity-based interventions to reduce mortality risk within diverse communities.

Table 3. Specific Types of Late-Life Social Activities (as Separate Predictors) and Mortality

<table>
<thead>
<tr>
<th>Individual predictors</th>
<th>Model 1</th>
<th>Fully adjusted Model 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Going to restaurant or sporting event</td>
<td>1.013</td>
<td>1.061</td>
</tr>
<tr>
<td>p=0.884</td>
<td>p=0.888, 1.267</td>
<td>p=0.512</td>
</tr>
<tr>
<td>Taking day or overnight trips</td>
<td>0.876</td>
<td>0.881</td>
</tr>
<tr>
<td>p=0.220</td>
<td>p=0.708, 1.095</td>
<td>p=0.255</td>
</tr>
<tr>
<td>Doing unpaid community or volunteer work</td>
<td>0.877</td>
<td>0.892</td>
</tr>
<tr>
<td>p=0.032</td>
<td>p=0.777, 0.989</td>
<td>p=0.068</td>
</tr>
<tr>
<td>Visiting relatives' or friends' homes</td>
<td>0.862</td>
<td>0.872</td>
</tr>
<tr>
<td>p=0.054</td>
<td>p=0.742, 1.003</td>
<td>p=0.1018</td>
</tr>
<tr>
<td>Participating in any groups (such as senior center and church-related, charity, public service, or community groups)</td>
<td>0.806</td>
<td>0.834</td>
</tr>
<tr>
<td>p=0.004</td>
<td>p=0.696, 0.935</td>
<td>p=0.021</td>
</tr>
<tr>
<td>Attending church or religious services</td>
<td>0.877</td>
<td>0.910</td>
</tr>
<tr>
<td>p=0.116</td>
<td>p=0.745, 1.033</td>
<td>p=0.283</td>
</tr>
<tr>
<td>Shopping with friends</td>
<td>0.958</td>
<td>0.954</td>
</tr>
<tr>
<td>p=0.060</td>
<td>p=0.817, 1.123</td>
<td>p=0.575</td>
</tr>
<tr>
<td>Going to parties or other social events (such as senior dances or nightclubs)</td>
<td>0.796</td>
<td>0.804</td>
</tr>
<tr>
<td>p=0.026</td>
<td>p=0.652, 0.973</td>
<td>p=0.037</td>
</tr>
</tbody>
</table>

Note: Boldface indicates statistical significance using 95% CI (p<0.05). Values are reported as Cox proportional hazard ratios (95% CIs) and p-values. Model 1 adjusted for age, sex, education, cardiovascular disease risk factor burden, and depressive symptomatology, and fully adjusted Model 2 covariates included age, sex, education, cardiovascular disease risk factor burden, depressive symptomatology, and motor gait performance.

Taken together, engagement in late-life social activities by older African American adults was the social engagement metric most consistently and robustly associated with reduced mortality risk. These results lay the foundation for considering community-based approaches to increase and/or maintain social participation—one of the most important modifiable factors noted by the 2020 Lancet Commission—as a potential means by which to increase longevity in older African Americans.

This study contributes to the literature in several important ways. First, with its focus on aspects of late-life social engagement, it adds to the growing body of literature addressing this protective factor for health. Furthermore, results focus on the discussion around the social activities themselves and, by association, the groups one might interact with when conducting these activities as opposed to the mere social network size or life space of a given individual. Second, conducting this work within a cohort of older African Americans provides information in a minoritized community to contrast with previous studies focused predominantly on White older adults (e.g.,). In addition, this study contributes to the dearth of critical empirically based insights regarding the key aspects of late-life social activities that may decrease mortality for older African Americans, including activities that are central to the lived experiences of African Americans in the U.S. In fact, several of the organizational activities associated with reduced mortality in this study have historically been a critical source of strength and support within the African American community because these community members have leveraged many of the same organizations and social ties to find strength and mobilize against experiences of systemic racism and discrimination in the U.S. It follows that recently proposed pathways linking social engagement to health—specifically, the role of bonding ties, that is, a network of close ties and meaningful social roles—should be explored within the African American population. In fact, more work in general is needed within race and/or ethnicity if the field is to sufficiently promote culturally compatible activity-based interventions to reduce mortality risk within diverse communities.

Although certain activities at the core of the lived experience of African Americans (e.g., participation in church-related and other community-based groups) decreased mortality risk in this study, it should be noted that it was not attending church or religious services alone that decreased risk but active participation in any groups, including (but not limited to) church-related groups. Likewise, it was not the theoretical construct of purpose in life but actual purposeful activities and interactions. This is in keeping with some but not all studies investigating these issues as related to mortality risk. Mixed results may be due, in part, to the make-up of the populations studied, including the highly secularized characteristics of some of the samples in question, and/or the individual purpose assigned to church attendance versus extracurricular church- and other community-based activities. In fact, it appeared to be the social interactions with others in a positive context, including doing unpaid community or volunteer work and ultimately participating in any group setting including but not limited to church-related, charity, public service, or community groups, that reduced mortality for older African Americans. The fact that purpose in life was not related to reduced mortality risk further speaks to the important influence of positive context for social interactions for...
the current sample. Higher levels of social activity have also been associated with slower declines in cognition for older African Americans\(^{19,34}\); however, some studies suggest that one must conduct these activities with friends to see an effect.\(^{35}\) This may not be the case in this study cohort given that the associations of a specific question regarding visiting at relatives’ or friends’ houses and a metric of social network size with mortality risk were not significant. Alternatively, there may be something about the inter-relationship between purposeful social engagement and the cognitive, physical, and convivial activity it requires and promotes\(^{36}\) that supports its role in reducing mortality risk in older African Americans; more work is needed to dissect this particular hypothesis.

This study should be interpreted with knowledge of its strengths and limitations. Strengths include the fact that this is one of the largest within-race studies of older African Americans investigating aspects of late-life social engagement as related to mortality risk, with follow-up time ranging as high as 15 years for some participants. Furthermore, individuals diagnosed with dementia at baseline were excluded to ensure that self-reported measures of social engagement were not confounded by cognitive impairment. Finally, data were overall very complete, with, on average, 97% of participants included in fully adjusted models containing all covariates.

**Limitations**

Limitations include the fact that although the analytic sample was community dwelling, it was based on a volunteer as opposed to a random sample of the population. In addition, the measure of CVD risk factor burden was not derived from objective assessments of blood pressure or blood glucose; however, accurate self-reporting of these disease states has been found to be most prevalent in older adults.\(^{37}\) Furthermore, although the measures of social participation were all self-reported, in contrast to a previous study that found that objective measures of social participation but not self-reported measures of loneliness predicted mortality,\(^{38}\) this study nonetheless detected robust associations between self-reported measures of social participation and mortality risk. Finally, although social network size considered the number of people whom each participant had seen, it did not consider the number of people whom each participant had spoken to by phone and/or video, and individual social items, although conceived of as distinctly contributing to the overall score, may have been interpreted by individual participants as more overlapping than intended.

**CONCLUSIONS**

This study suggests that older African Americans who actively volunteer; participate in groups within senior centers, churches, charities, and public-based and/or community-based organizations, or go to parties and other social events have, at minimum, a 12% reduction in mortality risk regardless of demographic, health, and psychosocial-related factors, with most of these activities remaining significantly associated with mortality after further adjustment for motor gait performance. Clinicians working with older African Americans should query for participation in purposeful, preferably group activities central to their lived experiences. As the world awakens from the pandemic caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), associated lockdowns and forced social isolation, discussing and encouraging social activity will be key to promoting health and longevity in older adults regardless of race or ethnicity.\(^{39,40}\)

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**SUPPLEMENTAL MATERIAL**

Supplemental materials associated with this article can be found in the online version at [https://doi.org/10.1016/j.amepre.2022.05.005](https://doi.org/10.1016/j.amepre.2022.05.005).

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