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## Purpose in Life Is Associated With Mortality Among Community-Dwelling Older Persons

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### Abstract

**Objective**—To assess the association between purpose in life as an important determinant of health outcomes and mortality in community-dwelling elderly persons.

**Methods**—We used data from 1238 older persons without dementia from two longitudinal cohort studies (Rush Memory and Aging Project and Minority Aging Research Study) with baseline evaluations of purpose in life and up to 5 years of follow-up to test the hypothesis that greater purpose in life is associated with a reduced risk of mortality among community-dwelling older persons.

**Results**—The mean  $\pm$  standard deviation score on the purpose in life measure at baseline was  $3.7 \pm 0.5$  (range = 2–5), with higher scores indicating greater purpose in life. During the 5-year follow-up (mean = 2.7 years), 151 of 1238 persons (12.2%) died. In a proportional hazards model adjusted for age, sex, education, and race, a higher level of purpose in life was associated with a substantially reduced risk of mortality (hazard ratio = 0.60, 95% Confidence Interval = 0.42, 0.87). Thus, the hazard rate for a person with a high score on the purpose in life measure (score = 4.2, 90th percentile) was about 57% of the hazard rate of a person with a low score (score = 3.1, 10th percentile). The association of purpose in life with mortality did not differ among men and women or Whites and Blacks. Further, the finding persisted after the addition of terms for several potential confounders, including depressive symptoms, disability, neuroticism, the number of chronic medical conditions, and income.

**Conclusion**—Greater purpose in life is associated with a reduced risk of all-cause mortality among community-dwelling older persons.

### Keywords

purpose in life; mortality; longevity; well-being; successful aging; goal-directedness

## INTRODUCTION

Identifying factors associated with positive health outcomes and longevity has been a longstanding but challenging research endeavor. Most of the existing literature defines health as the absence of disease or illness, and studies examining potentially modifiable determinants of positive health outcomes are limited (1-4). For example, although several investigators have

argued that a focus on human flourishing may inform efforts to understand successful aging (5-8), few studies of older persons have examined whether such factors contribute to longevity.

Having a sense of purpose in life is thought to be a particularly important component of human flourishing (5-11). The construct of purpose in life stems from humanistic psychology and the philosophical writings of Victor Frankl, who observed during his experiences in a concentration camp that life can be meaningful even under conditions of extreme adversity and that having a sense of purpose is essential to maintaining psychological health and wellness (12). More recently, Ryff and Keyes proposed that purpose in life is one of six key dimensions of psychological well-being (8,13). In the context of well-being, purpose in life refers to the sense that life has meaning and direction and that one's goals and potential are being achieved or are achievable. Greater purpose in life has been shown to be associated with several psychological outcomes, including a more positive outlook on life, happiness, satisfaction, and self-esteem (10,13-16).

In addition to its association with psychological outcomes, purpose in life has long been hypothesized to be an important determinant of physical health and vitality (5,8,11,12,15). However, prospective data regarding the association of purpose in life with mortality are lacking. In the present study, purpose in life is operationally defined as a complex, multidimensional construct that reflects the tendency to derive meaning from life's experiences and possess a sense of intentionality and goal-directedness that guides behavior. We used data from two large, ongoing studies of aging to test the hypothesis that greater purpose in life is associated with a reduced risk of all-cause mortality.

## METHODS

### Participants

Participants are from two ongoing studies of aging, both of which are described below and were approved by the Institutional Review Board of Rush University Medical Center. Importantly, these studies have very similar data collection and operational methods, which facilitate analyses of data from the combined cohorts.

**Memory and Aging Project**—The Rush Memory and Aging Project (MAP) (17), which began in 1997, is a longitudinal clinical-pathological study of common chronic conditions of aging. Participants are older persons recruited from about 40 continuous care retirement communities and senior subsidized housing facilities in and around the Chicago metropolitan area. Study participation requires agreeing to detailed annual clinical evaluations and organ donation at the time of death. Between 1997 and 2007, >1200 older persons enrolled in the study. The Purpose in Life scale (8) was added to the interview in 2001.

**Minority Aging Research Study**—The Minority Aging Research Study (MARS) began in 2004 and is a study of risk factors for cognitive decline in older Blacks. Participants are recruited from community-based organizations, churches, and senior-subsidized housing facilities; the catchment area is within that of MAP. Study participation requires agreeing to detailed annual clinical evaluations and cognitive testing. Between 2004 and 2007, >350 older persons enrolled in the study. The Purpose in Life scale (8) was included in the interview at baseline.

At the time of these analyses, 1342 persons (1001 MAP, 341 MARS) had undergone their baseline clinical evaluation since 2001. Of those, we excluded 104 with dementia (92 from MAP, 12 from MARS). This left 1238 eligible persons (909 from MAP, 329 from MARS); all analyses are based on this group. They were followed for up to 5 years, with a mean of 2.7 years of follow-up (MAP =  $2.9 \pm 1.6$  (standard deviation (SD)), MARS =  $1.9 \pm 0.8$ ). At baseline,

participants were a mean  $\pm$  SD age of  $78.0 \pm 7.8$  years (MAP =  $79.8 \pm 7.7$ , MARS =  $73.1 \pm 5.9$ ), had  $14.4 \pm 3.3$  years of education (MAP =  $14.3 \pm 3.1$ , MARS =  $14.9 \pm 3.6$ ), and a mean  $\pm$  SD score of  $27.9 \pm 2.3$  on the Mini-Mental State Examination (18) (MAP =  $27.9 \pm 2.2$ , MARS =  $27.9 \pm 2.5$ ); 73.6% were women and 67.2% were White.

### Clinical Evaluation

Participants from both studies underwent detailed annual uniform clinical evaluations that included a medical history, complete neurological examination, and cognitive function testing (17,19). A physician then clinically classified persons with respect to dementia using the criteria of the joint working group of the National Institute of Neurological and Communicative Disorders and Stroke and the Alzheimer's Disease and Related Disorders Association (20), which require a history of cognitive decline and evidence of impairment in at least two cognitive domains. Cognitive impairment was determined in the same way for both studies (17,19,21). The determination of cognitive impairment was made by a neuropsychologist after reviewing the results of a battery of 21 cognitive tests, 11 of which had educationally adjusted cutoff scores and an algorithm for rating impairment in five cognitive domains, plus information on sensory or motor limitations and effort.

### Assessment of Purpose in Life

Purpose in life (8) was assessed using a modified ten-item measure derived from Ryff's and Keyes's scales of Psychological Well-Being (8,13). Although the original scale included 20 items designed to measure purpose in life, several shortened versions (ranging from 3 to 14 questions) have been developed and evaluated psychometrically (8,22). We used a ten-item version in which participants rated their level of agreement with each item (e.g., I am an active person in carrying out the goals I set for myself) (see Appendix A for a full list of the ten items) on a 5-point scale. Ratings for items that were negatively worded were flipped so that higher scores on all individual items indicated greater purpose. Item scores then were averaged to yield a total score for each participant, with higher scores indicating greater purpose in life. Cronbach's coefficient  $\alpha$  was 0.75, indicating a moderate level of internal consistency (23). The mean  $\pm$  SD score on the purpose in life measure was  $3.7 \pm 0.5$  (range = 2–5) (MAP =  $3.6 \pm 0.5$ , MARS =  $3.8 \pm 0.5$ ).

### Other Covariates

Disability was assessed via the Katz scale, which includes six items that address basic activities of daily living: walking across a small room, bathing, dressing, eating, transferring from a bed to a chair, and toileting (24). A composite measure was created by summing the number of items on which participants reported the need for assistance; thus, higher scores indicated greater disability. The mean  $\pm$  SD score on the Katz scale was  $0.2 \pm 0.6$ , range = 0–6) (MAP =  $0.2 \pm 0.6$ , MARS =  $0.1 \pm 0.5$ ).

Depressive symptoms were assessed with a ten-item version of the Center for Epidemiologic Studies Depression scale (CES-D) (25,26). Persons were asked whether they had experienced each of ten symptoms in the past week, and the score was the number of symptoms reported. The mean  $\pm$  SD score on the CES-D was  $1.3 \pm 1.8$  (range = 0–10) (MAP =  $1.4 \pm 1.80$ , MARS =  $1.2 \pm 1.6$ ).

Neuroticism, the personality trait described as the tendency to experience psychological distress, was measured using the neuroticism subscale of the NEO Five-Factor Inventory to assess personality (27). Summary scores of the trait were computed, with higher scores indicating a higher level of neuroticism. The mean  $\pm$  SD score was  $2.0 \pm 7.2$  (MAP =  $2.6 \pm 7.2$ , MARS =  $0.2 \pm 7.0$ ).

Self-report history of seven medical conditions was recorded at baseline: diabetes, heart disease, hypertension, thyroid disease, cancer, head injury, and stroke. The total number of conditions present was used as an index of chronic illness (17). The mean  $\pm$  SD number of medical conditions was  $1.5 \pm 1.0$  (range = 0–6) (MAP =  $1.4 \pm 1.1$ , MARS =  $1.5 \pm 1.0$ ).

Other variables used in the analyses included age (based on date of birth), sex, education (years of schooling completed), race, and current income. Current income was measured at baseline via a single question. Persons were asked to select one of ten levels of total family income using the “show-card” method (28).

### Determination of Vital Status

The autopsy rate of the Rush MAP exceeds 80%. Thus, for most participants from the MAP, the exact date of death is known by being the day an autopsy was performed. In addition to their annual evaluations, participants from both cohorts (MAP and the MARS) also are contacted quarterly to determine vital status and changes in health, and death is occasionally learned of during quarterly contacts. Finally, research assistants for both studies regularly search the Social Security Death Index via the internet for the small number of persons we are unable to contact. At the time of these analyses, vital status was known for 100% of participants within the last 3 months.

### Data Analysis

We first examined the crude associations of purpose in life with age, gender, education, and race. Next, we examined the relation of purpose in life with mortality using a Cox proportional hazards model (29) adjusted for age, gender, education, and race. In subsequent models, we added terms for the interactions of age, gender, education, and race with purpose in life and examined several potential confounders of the association of purpose in life with mortality. We also conducted sensitivity analyses in which we excluded persons who died before the first year of follow-up or before the first or second year of follow-up. Finally, to examine whether our findings were driven by particular scale items, we examined item-level associations of purpose in life with mortality. Model validation was performed graphically and analytically and there was no evidence of nonlinearity or nonproportionality. Programming was done in SAS (30).

## RESULTS

### Psychometric Properties of Purpose in Life

Baseline scores on the purpose in life measure ranged from 2.0 to 5.0 (mean  $\pm$  SD =  $3.7 \pm 0.5$ ), with higher scores indicating greater purpose in life. Purpose in life was modestly associated with age ( $r = -.34$ ,  $p < .001$ ) and education ( $r = .32$ ,  $p < .001$ ). Among participants in these cohorts, women reported lower purpose in life compared with men ( $p = .009$ ), and Whites reported lower purpose in life compared with Blacks ( $p < .001$ ). The correlations of purpose in life with the covariates of interest are shown in Table 1.

### Purpose in Life and Mortality

Over up to 5 years of follow-up (mean = 2.7), 151 of 1238 persons (12.2%) persons died. Table 2 provides crude data on those who died and those who survived at baseline. Those who died were older and more apt to be male and Black than survivors and reported lower purpose in life than survivors. In addition, those who died reported higher baseline levels of depressive symptoms, disability, and neuroticism.

We first examined the association of purpose in life with the risk of mortality in a proportional hazards model adjusted for age, gender, education, and race. In this analysis, greater purpose

in life was associated with a reduced risk of mortality (hazard ratio (HR) = 0.60, 95% Confidence Interval (CI) = 0.42, 0.87). Thus, as illustrated in Figure 1, the hazard rate for a person with a high score on the purpose in life measure (score = 4.2, 90th percentile) was about 57% of the hazard rate of a person with a low score (score = 3.1, 10th percentile).

Next, because the association of purpose in life with mortality may vary along demographic lines, we repeated the analysis described above with additional terms for the interactions of age, gender, education, and race with purpose in life in separate models. No interactions were found, suggesting that the association between purpose in life and mortality does not vary by age or education or among men and women or Whites and Blacks (all  $p > .2$ ).

Finally, to examine several potential confounders of the association of purpose in life with mortality, we repeated the analysis described above with additional terms for depressive symptoms, disability, neuroticism, the number of chronic medical conditions, and income (Table 3). The association of purpose in life with mortality persisted and was not substantially reduced after adjustment for these covariates.

### Sensitivity Analyses

In sensitivity analyses aimed to examine the robustness of the findings, we repeated the core model reported above after first excluding persons who died before the first follow-up (Model 1) and then after excluding persons who died before the first or second follow-up (Model 2). Notably, the hazard ratios were not substantially changed in these analyses (Model 1: HR = 0.57, 95% CI = 0.38, 0.85; Model 2: HR = 0.76, 95% CI = 0.45, 1.24), although power was limited in these analyses due to the smaller number of deaths.

### Secondary Analyses: Item-Level Associations

Finally, we conducted individual item-level analyses to better understand the association of purpose in life with the risk of mortality and determine whether the findings were driven by particular scale items. Thus, we repeated the core proportional hazards model described above separately for each of the ten items on the purpose in life scale. Significant associations with mortality were found for three of the ten items: 1) “I sometimes feel as if I’ve done all there is to do in life” (HR = 0.80, 95% CI = 0.68, 0.96); 2) “I used to set goals for myself, but that now seems like a waste of time” (HR = 0.76, 95% CI = 0.64, 0.90); and 3) “My daily activities often seem trivial and unimportant to me” (HR = 0.82, 95% CI = 0.69, 0.98). In addition, we created a composite score based on those three items and examined its association with the risk of death (HR = 0.65, 95% CI = 0.52, 0.83).

## DISCUSSION

We examined the association of purpose in life with mortality in >1200 community-dwelling older persons. During 5 years of follow-up, greater purpose in life was associated with a substantially reduced risk of death; more specifically, the hazard rate of a person with a high score (90th percentile) on the purpose in life measure was about 57% of the hazard rate for a person with a low score (10th percentile). The association of purpose in life with mortality did not vary by age, gender, education, or race, and the finding persisted after adjustment for several important covariates, including depressive symptoms, disability, neuroticism, the number of medical conditions, and income. The finding that purpose in life is related to longevity in older persons suggests that aspects of human flourishing—particularly the tendency to derive meaning from life's experiences and possess a sense of intentionality and goal-directedness that guides behavior—contribute to successful aging.

Importantly, although several investigators have argued that a focus on more positive factors may provide unique insights into longevity (1,3,8,10), prior research examining successful or healthy aging has focused almost exclusively on the absence of disease or illness (31,32). This is an important limitation of the existing research. Positive factors, such as having a sense of purpose in life, may provide a buffer against negative health outcomes, particularly in old age. In keeping with this idea, purpose in life is associated with psychological health and well-being in younger persons (5,8,11,13,15). Although purpose in life is widely thought to be associated with other positive health outcomes, we are not aware of any prior study that has examined whether greater purpose in life is associated with a reduced risk of all-cause mortality.

Perhaps surprisingly, the association of purpose in life with mortality did not vary by age, sex, education, or race. Although prior work suggests that purpose in life is strongly associated with age, with older adults reporting lower purpose in life than younger adults (5,33,34) (see Reker et al. (35) for an exception), most of the available studies are cross-sectional, leaving open the question of how purpose in life changes with advancing age. Knowledge of the relation of purpose in life with other demographic characteristics is limited. In this study, men reported higher purpose than women, and Blacks reported higher purpose than Whites; it is possible that racial differences may be related to spirituality or religiosity, but we do not have data to examine that directly and other factors may be important. It also is possible that widowhood may negatively affect purpose in life among older women compared with men, but this is speculative. Nevertheless, although the reasons for these differences are unclear, our findings suggest that the association of purpose in life with mortality does not vary along demographic lines. It will be important for future studies to examine whether the association of purpose in life with mortality might be modified by other variables not measured here.

It is noteworthy that there remains some debate regarding the extent to which purpose in life may be an indicator of or proxy for depression rather than a distinct construct (5). In our analyses, the association of purpose in life with mortality persisted even after adjustment for depressive symptoms, as well as several other potential confounders, including disability, neuroticism, the number of chronic medical conditions, and income. Whereas purpose in life was negatively correlated with depressive symptoms ( $r = -.32, p < .001$ ), purpose in life was more strongly associated with the personality trait of neuroticism ( $r = -.43, p < .001$ ); this may suggest that purpose in life is trait-like. Further, these findings provide some support for the construct of purpose in life and suggest that it is not merely a proxy for depression. Moreover, the results of our item-level analyses suggest that having a sense of purpose and goal-directedness in daily activities contribute to longevity. We suspect that older persons who derive purpose and meaning from life on a daily basis and who set and work toward goals may function better in aging not because they are without negative affect, but rather because they are highly engaged, focused and intentional, and participate in meaningful activities. Additionally, purpose in life in old age may involve a component of life review and it is possible that persons with higher purpose in life have a more positive view of aging or even a more positive life orientation in general. Although we think that purpose in life is important across the life span, measurement of purpose in life in older persons may reveal an enduring sense of meaningfulness and intentionality in life that may have particular relevance for age-related health outcomes. Purpose in life is potentially modifiable, and more research is needed to determine its association with other important age-related health outcomes, such as disability and Alzheimer's disease. Further, future studies should examine whether purpose in life can be enhanced in older persons, perhaps via interventions to promote goal setting and participation in personally meaningful activities as well as engagement in behaviors that will lead to the accomplishment of goals.

Importantly, the biologic basis of the association of purpose in life with mortality is unknown. One possibility is that having a greater sense of purpose in life contributes to the effective



functioning of multiple biological systems (5). If this is the case, purpose in life may help maintain optimal functioning of biological systems and thereby confer protective benefit in the face of illness or disease (5,36-38). Although few studies have examined the link between purpose in life and indicators of physiological health, there is some evidence that psychological well-being in general, and purpose in life in particular, are associated with important biomarkers. For example, in a recent study, Ryff et al. examined the associations of six domains of well-being, including purpose in life, with multiple neuroendocrine, immune, and cardiovascular biomarkers in women aged >65 years (5). The investigators reported significant associations between purpose in life and neuroendocrine and immune markers including salivary cortisol and the proinflammatory cytokine sIL-6r, particularly among those over the age of 75 years. In addition, purpose in life was positively correlated with high-density lipoprotein cholesterol and negatively with waist/hip ratios. Purpose in life also has been shown to be negatively related to inflammatory markers in another group of older women (38). Together, these findings extend prior work showing that psychosocial factors, such as coping and social support (39-41), are linked with important disease-related biomarkers and indicate a need for future studies examining the potential biologic basis of the association of purpose in life with mortality.

This study has several strengths, including the assessment of purpose in life in a large group of community-dwelling older persons, who underwent a uniform clinical evaluation and in whom widely accepted criteria were used to exclude persons with dementia. In addition, we examined several potential confounders of the association of purpose in life with mortality. Limitations include the selected nature of the cohort, which may have restricted our range of scores on the purpose in life measure and may limit the generalizability of findings. In addition, we did not examine how purpose in life changes with age or measure some factors (e.g., religiosity) that may influence purpose in life. Future studies are needed to better understand the trajectory of purpose in life in aging and further examine the association of purpose in life with additional health outcomes.

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## Appendix

### Appendix A 10 Item Purpose in Life Measure

1. I feel good when I think of what I've done in the past and what I hope to do in the future.
2. I live life one day at a time and don't really think about the future.
3. I tend to focus on the present, because the future nearly always brings me problems.
4. I have a sense of direction and purpose in life.
5. My daily activities often seem trivial and unimportant to me.
6. I used to set goals for myself, but that now seems like a waste of time.
7. I enjoy making plans for the future and working them to a reality.
8. I am an active person in carrying out the plans I set for myself.

9. Some people wander aimlessly through life, but I am not one of them.
10. I sometimes feel as if I've done all there is to do in life.

## Glossary

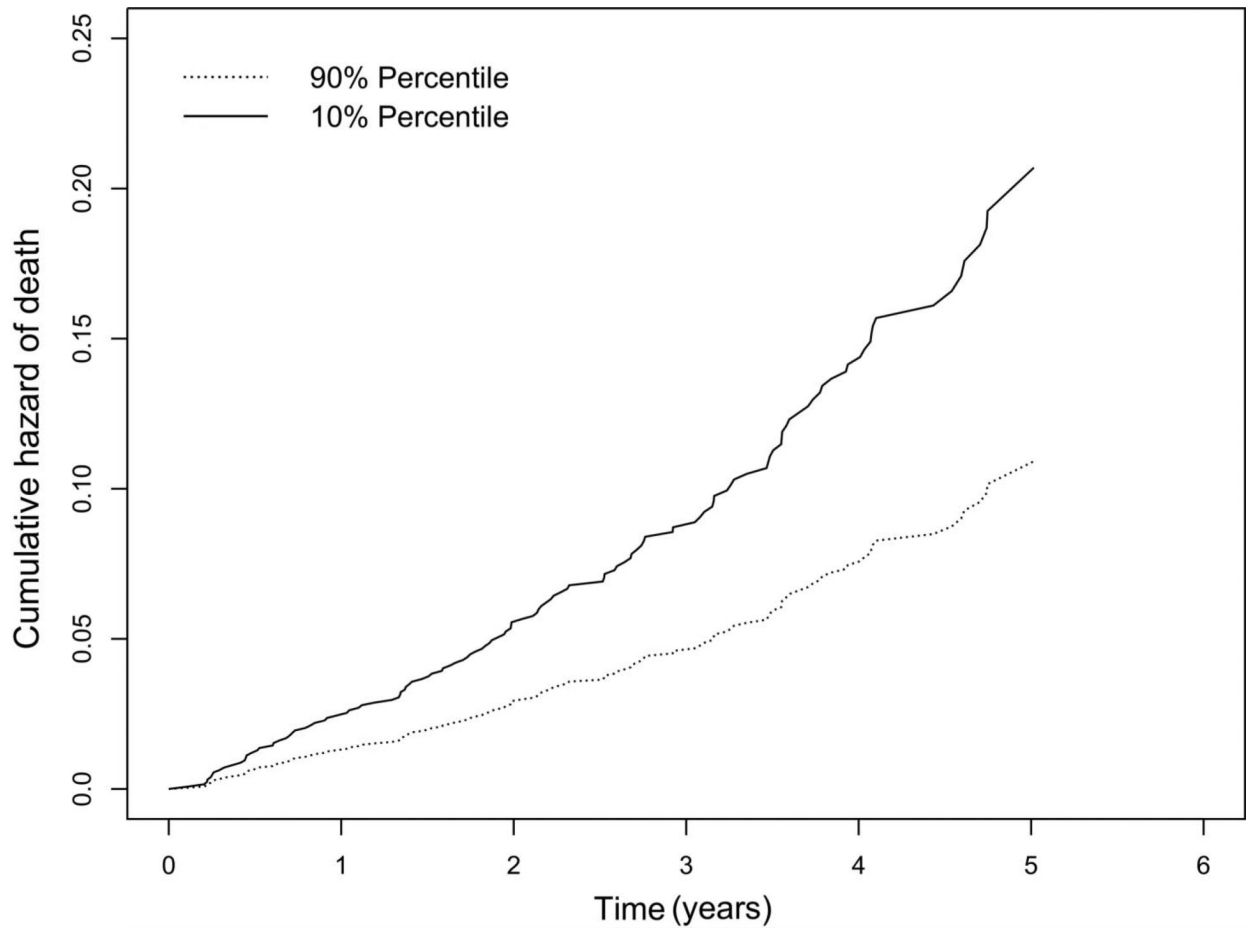
MAP, Memory and Aging Project; MARS, Minority Aging Research Study; CES-D, Center for Epidemiologic Studies Depression scale.

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**Figure 1.**  
Cumulative hazard of mortality for participants with high versus low purpose in life.

**TABLE 1**  
Correlations of Purpose in Life With Covariates of Interest

| Covariate                    | Correlation With Purpose in Life ( <i>n</i> = 1238) | <i>p</i> |
|------------------------------|---|----------|
| Depressive symptoms          | -.32  | <.001    |
| Disability                   | -.16  | <.001    |
| Neuroticism                  | -.43  | <.001    |
| Number of medical conditions | -.05  | .05      |
| Income                       | .28   | <.001    |

**TABLE 2**  
Baseline Characteristics of Participants Who Survived or Died

| Characteristic <sup>a</sup>  | Survived ( <i>n</i> = 1087) | Died ( <i>n</i> = 151) | <i>p</i> |
|------------------------------|-----------------------------|------------------------|----------|
| Age                          | 76.3                        | 83.7                   | <.001    |
| Gender (% female)            | 66.3                        | 7.3                    | <.001    |
| Race (% White)               | 56.5                        | 10.7                   | <.001    |
| Education                    | 14.5                        | 14.2                   | .27      |
| Purpose in life              | 3.7                         | 3.5                    | <.001    |
| Depressive symptoms          | 1.3                         | 1.6                    | .008     |
| Disability                   | 0.1                         | 0.3                    | <.001    |
| Neuroticism                  | 1.8                         | 3.5                    | .018     |
| Number of medical conditions | 1.46                        | 1.45                   | .63      |

<sup>a</sup> Mean values are presented unless otherwise noted and statistical significance is based on *t* tests or  $\chi^2$  tests, as appropriate.

**TABLE 3**

Association of Purpose in Life With Mortality After Adjustment for Potential Confounders

| Covariate                                       | HR <sup>a</sup> | 95% CI     |
|---|-----------------|------------|
| Depressive symptoms ( <i>n</i> = 1236)          | 0.67            | 0.46, 0.98 |
| Disability ( <i>n</i> = 1236)                   | 0.64            | 0.44, 0.93 |
| Neuroticism ( <i>n</i> = 1234)                  | 0.67            | 0.45, 0.99 |
| Number of medical conditions ( <i>n</i> = 1236) | 0.60            | 0.42, 0.87 |
| Income ( <i>n</i> = 1228)                       | 0.61            | 0.41, 0.90 |

HR = hazard ratio; CI = Confidence Interval.

<sup>a</sup> All models controlled for age, gender, education, and race.