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RESEARCH ARTICLE

Associations Between Purpose in Life and Mortality by SES

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Introduction: Having a higher purpose in life has been linked to favorable health outcomes. However, little research has examined whether the purpose–health association persists across different levels of SES. This study assesses whether the association between higher purpose in life and lower mortality is similar across the levels of SES.

Methods: A national sample of 13,159 U.S. adults aged >50 years from the Health and Retirement Study was analyzed. The baseline year was 2006–2008. Purpose in life was assessed at baseline using Purpose in Life Subscale of the Ryff Psychological Well-being Scales. The risk of death during an 8-year follow-up was assessed. SES was measured using education, income, and wealth. Using multivariable Poisson regression, effect modification by SES was tested on both the additive and multiplicative scales. Analyses were done in 2020.

Results: In analyses stratified by SES, people with the highest level of purpose consistently tended to have lower mortality risk across the levels of SES than those with the lowest level of purpose. However, people with middle-range purpose levels had lower mortality risk only if they also had mid-to-high education, income, and wealth. When formally testing the effect modification by SES, there was modest evidence that the associations between higher purpose and lower mortality were stronger among individuals with high education, income, and wealth.

Conclusions: The highest level of purpose appeared protective against all-cause mortality regardless of the levels of SES. By contrast, when levels of purpose were more modest, people with lower SES may benefit less health-wise from having a purpose.

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INTRODUCTION

Biomedical science and public health have almost exclusively focused on reducing risk factors. This deficit-focused approach has generated important preventive and therapeutic interventions. However, an emerging body of research suggests that also focusing on increasing health-promoting assets may be valuable, and emerging research suggests that there are modifiable health assets that contribute to reduced risk of chronic disease and mortality.[1,2] Purpose in life, the extent that people perceive their lives as having a sense of direction and goals, is a promising candidate health asset, and growing evidence suggests that it has salubrious effects.[3–8] Studies suggest that higher purpose is associated with a healthier biological function (e.g.,

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reduced allostatic load, reduced inflammation),[9−11] better physical function, reduced risk of chronic disease (e.g., lower risk of cardiovascular disease and declining cognitive function),[10,12−17] lower cause-specific mortality (e.g., lower mortality risk from heart, circulatory, and blood conditions—but not other causes),[18] and lower all-cause mortality.[13]

Limited work has considered whether the purpose−health relationship is moderated by key social structural factors such as SES.[19] Specifically, individuals with higher SES might receive greater benefit from a sense of purpose than those with lower SES because they are more likely to have infrastructural resources that facilitate the mechanisms through which purpose provides health benefits. For example, evidence suggests that purpose enhances health by increasing the likelihood of engaging in healthy behavior.[17,20] However, the intermediate pathway(s) through which purpose provides health benefits (i.e., promoting healthy behaviors) may be disrupted by a lack of resources (e.g., unable to afford a gym membership or live in a neighborhood without adequate walking or bike paths).

Understanding the potentially heterogeneous effects of purpose on health by SES can help identify the subgroups where purpose interventions might be more or less health protective. For example, finding that purpose is associated with favorable health across the SES spectrum might suggest that the health benefits of purpose are realizable in multiple SES environments.[21] Alternatively, results might suggest that potential purpose interventions have larger beneficial health effects in only specific subgroups unless additional infrastructural resources are also available. However, little research has formally examined whether the association between a sense of purpose and health (or mortality) is modified by SES. To address this research gap, this study examines whether the longitudinal association between purpose and all-cause mortality differs by levels of education, income, and wealth (i.e., effect modification by SES) among U.S. older adults.

METHODS

Study Population

Data were from the Health and Retirement Study (HRS), an ongoing nationally representative panel study of U.S. adults aged >50 years. It began in 1992 and surveys participants every 2 years; in 2006, study staff began visiting a randomly selected 50% of HRS study participants for an enhanced face-to-face interview. The remaining 50% of participants were assessed with the same protocol in 2008. After these interviews, respondents were given a self-administered psychosocial questionnaire that included an assessment of purpose.[22] The questionnaires were completed and returned by mail; the response rate was 88% in 2006 and 84% in 2008.

Respondents were combined from both time points (N=13,770) and time point 2006–2008 was considered the baseline for this study. Individuals with missing information on either purpose or death (n=611) were excluded, resulting in a final analytic sample of 13,159 participants. Because the study used deidentified, publicly available data, the Harvard T.H. Chan School of Public Health IRB exempted it from review. In addition, all HRS respondents provided written informed consent.

Measures

To keep the length of follow-up constant across all participants, information about death was obtained up to 2014 (for the 2006 subsample) and up to 2016 (for the 2008 subsample). Thus, this study assessed death over an 8-year follow-up period in each subsample (2006−2014 and 2008−2016). Information about death was obtained first by an exit interview conducted with the next of kin. When confirming the exit interviews with deaths reported by the National Death Index, there was a 95.5% match.[23]

Purpose in life was assessed at baseline (2006–2008) using the validated 7-item Purpose in Life Subscale of the Ryff Psychological Well-being Scales.[24] Participants responded to each item on a 6-point Likert-type scale, and an overall score was derived using the mean of item responses such that higher scores reflect higher purpose (Cronbach's α=0.74). Following HRS protocol, if respondents completed >5 of 7 items, a purpose score was derived (96.9%). To evaluate the possibility of a nonlinear relationship between purpose and mortality, purpose was assessed as quartiles on the basis of the baseline distribution of purpose scores in the analytic sample (Table 1 provides the cut points).

As potential effect modifiers of the association between purpose in life and mortality, 3 separate measures of SES at baseline were examined, including (1) education, (2) annual total household income, and (3) total wealth. These 3 factors were chosen because they are key SES indicators, they capture different aspects of social exposure, and they tap into the different mechanisms that influence health.[19] Missing income and total wealth values (but not educational attainment) were imputed by HRS as described in detail elsewhere.[25] Respondents self-reported their educational attainment and were categorized according to the highest degree they attained: less than high school, high school or GED, and college or more. Annual total household income was assessed and calculated as the sum of the respondents' and spouses' earnings, pensions, annuities, supplemental security income, social security disability income, social security retirement income, unemployment and workers' compensation, other government transfers, household capital income, and income from other sources.[26] The aggregated continuous income variable was then categorized into quartiles: (Quartile 1: ≤$20,024; Quartile 2: $20,025−$38,321; Quartile 3: $38,322−$71,895; and Quartile 4: ≥$71,896). Total wealth was calculated as the sum of the following: primary residence, real estate, vehicles, businesses, Individual Retirement Account/Keogh, stocks and mutual funds, checking, savings, money market accounts, Certificate of Deposits, government savings bonds, treasury bills, bonds or bond funds, mortgages, and debt. Net wealth was categorized into quintiles: Quintile 1, ≤$35,000; Quintile 2, $35,001−$140,000; Quintile 3,

Table 1. RRs for the Joint Exposure of Purpose in Life and Education (N=13,159)

Level of education	Sense of purpose in life[a] Low: Died/alive, *n*	Low: Risk ratio (95% CI)	Medium−low: Died/alive, *n*	Medium−low: Risk ratio (95% CI)	Medium−high: Died/alive, *n*	Medium−high: Risk ratio (95% CI)	High: Died/alive, *n*	High: Risk ratio (95% CI)	Additive and multiplicative effect modification: Low	Medium−low: Additive[b]	Medium−low: Multiplicative[c]	Medium−high: Additive	Medium−high: Multiplicative	High: Additive	High: Multiplicative
<High school	421/591	1.0	222/394	0.97 (0.82, 1.14); *p*=0.72	164/340	0.96 (0.80, 1.15); *p*=0.64	75/308	**0.68 (0.53, 0.87); *p*<0.01**	ref	ref	ref	ref	ref	ref	ref
High school	667/1,196	1.04 (0.92, 1.18); *p*=0.55	441/1,365	0.90 (0.78, 1.04); *p*=0.15	402/1,526	**0.86 (0.74, 0.99); *p*=0.03**	257/1,369	**0.77 (0.66, 0.91); *p*<0.01**	ref	−0.11 (−0.31, 0.09); *p*=0.30	0.89 (0.73, 1.10); *p*=0.28	−0.14 (−0.36, 0.07); *p*=0.20	0.86 (0.69, 1.07); *p*=0.18	0.05 (−0.16, 0.27); *p*=0.63	1.09 (0.82, 1.45); *p*=0.54
≥College	171/397	1.05 (0.88, 1.27); *p*=0.72	138/603	**0.81 (0.67, 1.00); *p*=0.05**	158/864	**0.76 (0.62, 0.92); *p*<0.01**	136/928	**0.70 (0.57, 0.86); *p*<0.01**	ref	−0.21 (−0.48, 0.06); *p*=0.13	0.80 (0.60, 1.05); *p*=0.11	−0.26 (−0.53, 0.02); *p*=0.07	**0.75 (0.56, 0.99); *p*=0.04**	−0.03 (−0.30, 0.24); *p*=0.81	0.98 (0.70, 1.37); *p*=0.89

Note: Boldface indicates statistical significance ($p<0.05$). The total number of cases in the table does not add up to the size of our analytic sample (n=13,159) because there was missing data in the education variable and because the number of cases was derived from those study respondents who did not have missing data on this variable. Risk ratios were adjusted for age, gender, race/ethnicity, marital status, household income, wealth, health insurance, heart disease, stroke, cancer, diabetes, hypertension, lung disease, arthritis, and depression using Poisson regression.

[a]Purpose in life was assessed using the Purpose in Life Subscale of the Ryff Psychological Well-being Scales. Purpose in Life Quartiles include low (1.00−3.86), medium−low (3.87−4.57), medium−high (4.58−5.29), and high (5.30−6.00).

[b]Effect modification on the additive scale includes RERI; SEs were calculated by using the delta method.

[c]Effect modification on the multiplicative scale included ratio of risk ratio.

RERI, relative excess risk due to interaction.

$140,001−$311,000; Quintile 4, $311,001−$652,500; and Quintile 5, ≥$652,501.

All covariates were self-reported at baseline and were selected a priori on the basis of existing literature and theoretical grounds.[1,17,27] They included sociodemographic characteristics, baseline physical health, and depression. Sociodemographic characteristics included age (continuous), gender (man, woman), race/ethnicity (White, Black, Hispanic, other), marital status (married, not married), and health insurance (covered, not covered). Baseline physical health included self-reported presence/absence of having a doctor's diagnosis for heart disease, cancer, stroke, diabetes, hypertension, lung disease, and arthritis. Depression was assessed using the 8-item Center for Epidemiological Studies Depression Scale (Cronbach's α=0.80; a score of ≥4 was categorized as depressed).[28]

Statistical Analysis

Because the outcome (death) was not rare (i.e., 24.7%), Poisson regression models[29] were used to estimate the association between baseline purpose and risk of death over the 8-year follow-up period. To assess for potential effect modification by each of the 3 SES indicators, 3 separate models were fit. In each model, product terms between baseline purpose (quartile dummy variable) and the SES indicator of interest (dummy variable) were introduced. In each of the models, the other 2 SES indicators, age, gender, race/ethnicity, marital status, health insurance, baseline health status, and depression were adjusted as potential confounders. All the 3 indicators of SES were included in each model because they can all be potential confounders of the purpose−mortality relationship. Because depression has been identified as a risk factor for mortality,[30] depression was adjusted for to reduce concerns that purpose simply reflects the absence of depression.

Following the framework proposed by Knol and VanderWeele,[31] a series of effect estimates and measures of effect modification were computed. First, using Poisson models, risk ratios were estimated to evaluate the association between purpose and mortality within each stratum of SES. Second, the risk ratios for the association of a joint exposure to purpose and SES with mortality over the 8-year follow-up period were estimated; the reference group in the second analysis was the group with the lowest purpose in life and lowest SES. Third, using the risk ratios for the joint purpose and SES exposure from the second analysis, measures of effect modification were estimated on both the additive (relative excess risk due to interaction [RERI]) and multiplicative (ratio of risk ratio) scales. Additive effect modification has rarely been reported in epidemiology despite its public health relevance. Appendix Text 1 (available online) provides a more detailed description of how to estimate and interpret these measures of effect modification. Appendix Table 1 (available online) provides an example of how the regression coefficients from the Poisson regression model that assesses the effect modification by education were combined. Because many statistical tests for effect modification by each level of each SES indicator were performed, low power and multiple testing are both concerns. Thus, a sensitivity analysis in which purpose and each SES indicator were coded as continuous variables was conducted. An omnibus test for multiplicative effect modification using single product terms between continuous purpose and a continuously coded version of each SES indicator was then conducted.

Among the analytic sample of 13,159 individuals, some participants were missing data on education and other covariates. Complete case analyses that ignored missing data resulted in a loss of 2.9% (n=377) of the analytic sample. Missing data were thus imputed using multiple imputations by chained equation.[32] All the variables used in the main analyses were included when creating 20 imputed data sets. The analyses were performed in each imputed data set and combined estimates across the data sets by Rubin's rule[33] using the R package mice. Additional information about the covariates and missing can be found in Appendix Text 2 (available online). All analyses were performed using R, version 3.6.0 in 2020.

RESULTS

Appendix Table 2 (available online) shows the descriptive statistics of the analytic sample. Among the 13,159 individuals in the study sample, 3,253 people (24.7%) died by the end of the 8-year follow-up period. Individuals with higher baseline purpose were less likely to die during the follow-up period than those with a lower purpose (e.g., 15.2% in the high-baseline-purpose group and 36.5% in the low-baseline-purpose group). Overall, those with higher baseline purpose tended to have higher SES, better baseline physical health, and a lower prevalence of depression than those with lower baseline purpose.

Associations between purpose and 8-year mortality risk, stratified by SES, are shown in Figure 1 and Appendix Table 3 (available online). Overall, people with high purpose consistently tended to have lower mortality risk than those with low purpose, regardless of educational attainment, income, or wealth. However, when analyzing people with mid-range levels of purpose (i.e., medium–high and medium–low levels of purpose), there was an association with mortality only among people who also had higher SES.

For example, within the levels of education, people who had high purpose consistently displayed lower mortality risk than those who low purpose. However, there was strong evidence that people with medium–high purpose had lower mortality risk only among people who attained high school (risk ratio=0.82, 95% CI=0.73, 0.94) or college degrees or higher (risk ratio=0.72, 95% CI=0.58, 0.89) but not among people with less than high-school degrees (risk ratio=0.96, 95% CI=0.80, 1.15). Similarly, there was evidence that people with mid-range purpose levels had lower mortality than those with low-range purpose only among those with higher income (Quartiles 3 and 4) or wealth (Quintile 5) and not among those with lower income (Quartiles 1 and 2) or wealth (Quartiles 1–4).

Tables 1–3 show the associations between the joint exposure of purpose and SES with mortality, where there was some evidence of negative effect modification by SES on both the additive and multiplicative scales. For

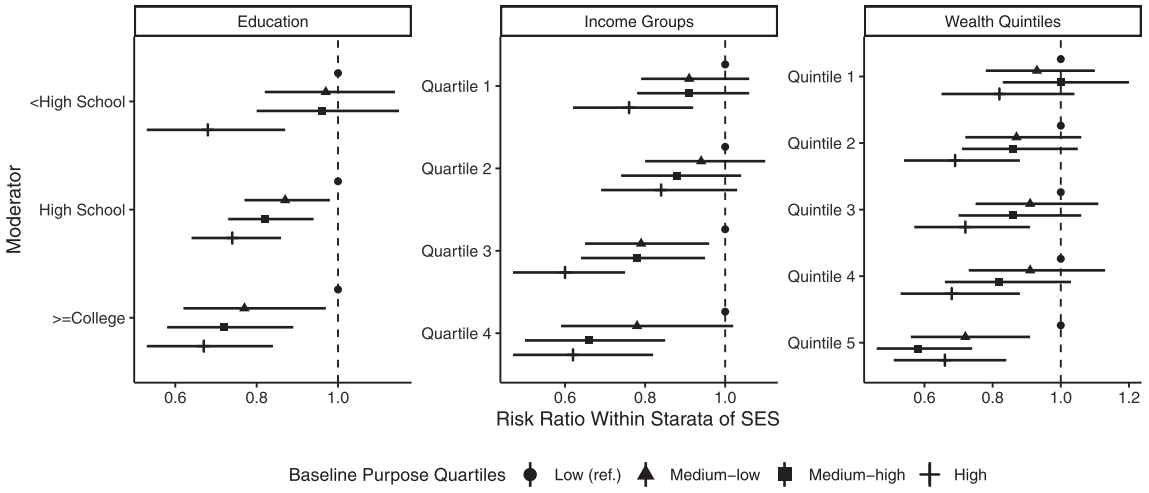

Figure 1. Associations between baseline purpose in life and 8-year mortality within strata of educational attainment, income quartiles, and wealth quintiles.

Note: Risk ratios were adjusted for age, gender, race/ethnicity, marital status, health insurance, heart disease, stroke, cancer, diabetes, hypertension, lung disease, arthritis, and depression using Poisson regression. Each model was further adjusted for the other 2 SES indicators (e.g., income and wealth for the education model). Purpose in life was assessed using the Purpose in Life Subscale of the Ryff Psychological Well-being Scales. Purpose in Life Quartiles include low (1.00–3.86), medium–low (3.87–4.57), medium–high (4.58–5.29), and high (5.30–6.00) purpose. Household income quartiles include 1st quartile (≤$20,024), 2nd quartile ($20,025–$38,321), 3rd quartile ($38,322–$71,895), and 4th quartile (≥$71,896). Wealth quintiles include 1st quintile (≤$35,000), 2nd quintile ($35,001–$140,000), 3rd quintile ($140,001–$311,000), 4th quintile ($311,001–$652,500), and 5th quintile (≥$652,501).

instance, the joint exposure of having medium–high purpose/being college educated or higher was more strongly associated with lower mortality risk than the simple sum of the 2 exposures alone (RERI= −0.26, 95% CI= −0.53, 0.02; ratio of risk ratio=0.75, 95% CI=0.56, 0.99) (Table 1). Similarly, modest evidence of negative effect modification was found for the joint exposure of medium–high purpose with either the highest income quartile (Quartile 4; RERI= −0.21, 95% CI= −0.47, 0.04; ratio of risk ratio=0.72, 95% CI=0.53, 0.98) (Table 2) or the highest quintile of wealth (Quintile 5; RERI= −0.40, 95% CI= −0.68, −0.13; ratio of risk ratio=0.58, 95% CI=0.43, 0.78) (Table 3).

For other joint exposures of purpose and SES indicators, despite point estimates consistently indicating negative effect modification (i.e., the joint exposure of higher purpose and higher SES was more strongly associated with lower mortality than the simple sum of the 2 exposures alone), CIs were wide, and evidence of effect modification was weak. However, the sensitivity analysis conducting an omnibus test (Appendix Table 4, available online) indicated strong evidence of multiplicative effect modification by income and wealth but not by educational attainment.

DISCUSSION

This study showed that in a national sample of U.S. adults aged >50 years, people who had the highest level of purpose consistently had lower mortality risk across all levels of SES. However, for people who had mid-range levels of purpose (i.e., medium–high/medium–low purpose compared with those with low purpose), the protective association against mortality was more strongly evident among people who also had higher SES, particularly income and wealth. Notably, when formally testing the measures of effect modification, the evidence of negative effect modification by SES, albeit weak in magnitude, was present on both the additive and multiplicative scale, which is the strongest form of effect modification for 2 preventive exposures.[34] Although the evidence is not definitive given that CIs were wide and the power to detect effect modification is usually very low, it is notable that most (48 of 54) measures of effect modification indicated negative effect modification on both the additive and the multiplicative scales. Moreover, the sensitivity analysis of an omnibus test indicated evidence of multiplicative effect modification by income and wealth, suggesting that the associations between higher purpose and lower mortality were stronger among individuals with higher income and wealth.

Overall, the findings suggest that although having very high levels of purpose may be universally beneficial

Table 2. Risk Ratios for the Joint Exposure of Purpose in Life and Income (N=13,159)

Household income quartiles[b]	Sense of purpose in life[a]								Additive and multiplicative effect modification							
	Low		Medium–low		Medium–high		High		Medium–low			Medium–high			High	
	Died/alive, *n*	Risk ratio (95% CI)	Died/alive, *n*	Risk ratio (95% CI)	Died/alive, *n*	Risk ratio (95% CI)	Died/alive, *n*	Risk ratio (95% CI)	Low	Additive[c]	Multiplicative[d]	Additive	Multiplicative	Additive	Multiplicative
1st Quartile	565/692	1.0	273/493	0.91 (0.79, 1.06); *p*=0.22	220/460	0.91 (0.78, 1.06); *p*=0.23	122/396	**0.76 (0.62, 0.92); *p*=0.01**	ref	ref	ref	ref	ref	ref	ref
2nd Quartile	353/591	0.93 (0.81, 1.07); *p*=0.33	252/627	0.87 (0.74, 1.02); *p*=0.09	205/609	**0.81 (0.69, 0.97); *p*<0.01**	140/526	**0.78 (0.64, 0.95); *p*=0.01**	ref	0.03 (−0.17, 0.22); *p*=0.80	1.02 (0.82, 1.27); *p*=0.83	−0.03 (−0.23, 0.18); *p*=0.81	0.96 (0.76, 1.22); *p*=0.76	0.10 (−0.13, 0.32); *p*=0.40	1.11 (0.84, 1.47); *p*=0.46
3rd Quartile	234/519	0.98 (0.83, 1.16); *p*=0.83	176/637	**0.78 (0.65, 0.93); *p*=0.01**	187/770	**0.76 (0.64, 0.92); *p*<0.01**	105/684	**0.58 (0.47, 0.73); *p*<0.01**	ref	−0.12 (−0.34, 0.11); *p*=0.30	0.87 (0.68, 1.11); *p*=0.25	−0.13 (−0.35, 0.10); *p*=0.28	0.86 (0.67, 1.10); *p*=0.23	−0.15 (−0.39, 0.08); *p*=0.21	0.79 (0.58, 1.07); *p*=0.12
4th Quartile	107/384	0.88 (0.70, 1.10); *p*=0.27	100/609	**0.68 (0.54, 0.86); *p*=0.01**	112/902	**0.58 (0.46, 0.72); *p*<0.01**	102/1,007	**0.55 (0.43, 0.69); *p*<0.01**	ref	−0.11 (−0.37, 0.15); *p*=0.41	0.85 (0.63, 1.16); *p*=0.31	−0.21 (−0.47, 0.04); *p*=0.10	**0.72 (0.53, 0.98); *p*=0.04**	−0.09 (−0.35, 0.17); *p*=0.50	0.82 (0.59, 1.15); *p*=0.25

Note: Boldface indicates statistical significance ($p<0.05$). Risk ratios were adjusted for age, gender, race/ethnicity, marital status, education, wealth, health insurance, heart disease, stroke, cancer, diabetes, hypertension, lung disease, arthritis, and depression using Poisson regression.

[a]Purpose in life was assessed using the Purpose in Life Subscale of the Ryff Psychological Well-being Scales. Purpose in Life Quartiles include low (1.00–3.86), medium–low (3.87–4.57), medium–high (4.58–5.29), and high (5.30–6.00).

[b]Household income quartiles include 1st quartile (≤$20,024), 2nd quartile ($20,025–$38,321), 3rd quartile ($38,322–$71,895), and 4th quartile (≥$71,896).

[c]Effect modification on the additive scale includes RERI; SEs were calculated using the delta method.

[d]Effect modification on the multiplicative scale includes ratio of risk ratio.

RERI, relative excess risk due to interaction.

Table 3. Risk Ratios for the Joint Exposure of Purpose in Life and Wealth (N=13,159)

	Sense of purpose in life[a]								Additive and multiplicative effect modification						
	Low		Medium–low		Medium–high		High			Medium–low		Medium–high		High	
Wealth quintiles[b]	Died/ alive, *n*	Risk ratio (95% CI)	Died/ alive, *n*	Risk ratio (95% CI)	Died/ alive, *n*	Risk ratio (95% CI)	Died/ alive, *n*	Risk ratio (95% CI)	Low	Additive[c]	Multiplicative[d]	Additive	Multiplicative	Additive	Multiplicative
1st Quintile	389/592	1.0	207/451	0.93 (0.78, 1.10); *p*=0.40	170/402	1.00 (0.83, 1.20); *p*=0.98	84/330	0.81 (0.64, 1.03); *p*=0.08	ref	ref	ref	ref	ref	ref	ref
2nd Quintile	2,990/504	0.94 (0.81, 1.10), *p*=0.45	166/483	**0.82 (0.68, 0.99); *p*=0.04**	156/470	**0.82 (0.67, 0.99); *p*=0.04**	900/422	**0.66 (0.53, 0.84); *p*<0.01**	ref	−0.05 (−0.28, 0.18); *p*=0.68	0.94 (0.73, 1.21); *p*=0.63	−0.12 (−0.378, 0.13); *p*=0.33	0.87 (0.67, 1.13); *p*=0.29	−0.09 (−0.36, 0.18); *p*=0.52	0.87 (0.62, 1.22); *p*=0.42
3rd Quintile	234/430	0.89 (0.75, 1.05); *p*=0.18	164/456	**0.81 (0.67, 0.98); *p*=0.03**	142/555	**0.77 (0.63, 0.94); *p*=0.01**	88/539	**0.66 (0.51, 0.80); *p*<0.01**	ref	−0.01 (−0.25, 0.22); *p*=0.90	0.97 (0.75, 1.26); *p*=0.84	−0.12 (−0.37, 0.13); *p*=0.34	0.86 (0.66, 1.13); *p*=0.29	−0.06 (−0.33, 0.20); *p*=0.63	0.88 (0.63, 1.23); *p*=0.46
4th Quintile	172/361	0.85 (0.70, 1.03); *p*=0.09	155/515	**0.78 (0.64, 0.95); *p*=0.01**	142/638	**0.71 (0.57, 0.87); *p*<0.01**	88/640	**0.57 (0.45, 0.73); *p*<0.01**	ref	0.00 (−0.24, 0.24); *p*=0.99	0.99 (0.75, 1.30); *p*=0.92	−0.15 (−0.40, 0.11); *p*=0.27	0.83 (0.62, 1.11); *p*=0.21	−0.09 (−0.36, 0.19); *p*=0.54	0.83 (0.59, 1.18); *p*=0.31
5th Quintile	165/299	0.95 (0.78, 1.16); *p*=0.64	109/461	**0.68 (0.54, 0.86); *p*<0.01**	108/676	**0.55 (0.44, 0.69); *p*<0.01**	108/682	**0.63 (0.50, 0.80); *p*<0.01**	ref	−0.20 (−0.46, 0.06); *p*=0.13	0.77 (0.57, 1.03); *p*=0.08	**−0.40 (−0.68, −0.13); *p*<0.01**	**0.58 (0.43, 0.78); *p*<0.01**	−0.13 (−0.41, 0.15); *p*=0.36	0.82 (0.58, 1.16); *p*=0.24

Note: Boldface indicates statistical significance ($p<0.05$). Risk ratios were adjusted for age, gender, race/ethnicity, marital status, education, household income, health insurance, heart disease, stroke, cancer, diabetes, hypertension, lung disease, arthritis, and depression using Poisson regression.

[a]Purpose in life was assessed using the Purpose in Life Subscale of the Ryff Psychological Well-being Scales. Purpose in Life Quartiles include low (1.00–3.86), medium–low (3.87–4.57), medium–high (4.58–5.29), and high (5.30–6.00).

[b]Wealth quintiles include 1st quintile (≤$35,000), 2nd quintile ($35,001–$140,000), 3rd quintile ($140,001–$311,000), 4th quintile ($311,001–$652,500), and 5th quintile (≥$652,501).

[c]Effect modification on the additive scale includes RERI; SEs were calculated by using the delta method.

[d]Effect modification on the multiplicative scale included ratio of risk ratios.
RERI, relative excess risk due to interaction.

regardless of one's SES, more moderate levels of purpose may confer less health-promoting benefits among individuals with fewer resources. A potential reason is that a lack of economic resources may make it harder for people in lower-SES circumstances to engage in healthy behaviors. Thus, the intermediate pathway(s) through which purpose provides health benefits (i.e., promoting healthy behaviors) may be disrupted by the lack of resources unless the level of purpose is sufficiently high to motivate people with low SES to overcome the disadvantage and engage in healthy behaviors. Future research should identify these potential mechanisms because making health-relevant behaviors or psychological strategies more available and accessible to diverse individuals through intervention and policy might help enhance the potential health-protective effects of future purpose interventions in low-SES individuals. Future research should also evaluate whether differing mechanisms underlying the linkages between purpose and health outcomes are at work when considering people in different levels of SES.

The findings somewhat diverged from the only other existing study that evaluated the purpose–health association by SES. Using data from 1,275 adults in midlife in the U.S. Study, this study evaluated the association between purpose and several indicators of health in the context of differing levels of education. The authors observed that purpose was more protective against developing chronic conditions among study participants with lower education than among those with higher education; however, this association was not observed when evaluating other health-related outcomes such as self-rated physical health or waist circumference.[35] These findings and those from this earlier study might somewhat differ for several reasons, including differences in the study design (cross-sectional versus longitudinal), differences in the outcome(s) that were evaluated, differences in the age group of the sample, different analytic methods, and inclusion/exclusion of different covariates.

In addition to the differential effects of purpose on health by levels of SES, it is worth noting that distributions of purpose itself differ by SES. In the HRS data, purpose slightly decreases with declining SES along a gradient (Appendix Figure 1, available online), which is likely attributable to the challenging circumstances that low-SES individuals often experience.[36,37] However, the HRS data also indicate that a sizable number of people in lower SES levels display high purpose. A key question, especially as people age, is to identify the circumstances that enable individuals across the socioeconomic spectrum to achieve equity with regard to distributions of purpose.[38,39] Studying individuals who are able to cultivate and maintain high purpose, despite low-SES conditions, might help researchers identify individual-level factors (e.g., patterns of thinking, types of coping, methods of navigating chronically difficult situations) and social structural factors (e.g., variations in contexts, access to various resources) that can then be considered when developing interventions and policies aimed at increasing purpose for all.

This study had a number of strengths. It was conducted in a large and national sample of U.S. older adults. The study design was prospective, which minimizes concerns that observed associations might be due to retrospective reporting bias or reverse causality. An adjustment was further made for a range of key sociodemographic characteristics and health conditions to help address potential bias from confounding. In addition, the study used a validated and widely used measure of purpose.

Limitations

There are several study limitations. First, the analytic sample was composed of individuals aged >50 years, and the findings may not generalize to younger populations. Second, the items that made up the measure of purpose were principally concerned with goals rather than with broader life aims or a sense of mission or calling,[5,40] and these other factors may be differently associated with mortality.

CONCLUSIONS

There was evidence that SES might modify the association between purpose in life and 8-year mortality risk among older U.S. adults. A growing body of research suggests that a sense of purpose might emerge as an important upstream target for interventions and policies aimed at enhancing health behaviors and physical health. As this idea is considered, further work is needed to evaluate how the purpose–health association is patterned across the socioeconomic spectrum.

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SUPPLEMENTAL MATERIAL

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