Dispositional Optimism and All-Cause Mortality in Older Adults: A Cohort Study

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ABSTRACT

Objective: Optimism is modifiable and may be associated with healthy aging. We aim to investigate whether dispositional optimism is associated with all-cause mortality in adults 70 years and older.

Methods: Between 2010 and 2014, older adults free of serious cardiovascular disease and dementia were recruited through primary care physicians and enrolled in the *Asp*irin *R*educing *E*vents in the *E*lderly (ASPREE) clinical trial. Australian ASPREE participants were invited to participate in the ASPREE Longitudinal Study of Older Persons (ALSOP) that was running in parallel to ASPREE. Optimism was assessed at baseline using the Life Orientation Test—Revised. The association between optimism, divided into quartiles, and all-cause mortality was assessed using Cox proportional hazards models.

Results: A total of 11,701 participants (mean [standard deviation] age = 75.1 [4.24] years; 46.6% men) returned the ALSOP Social questionnaire and completed the Life Orientation Test—Revised. During a median follow-up of 4.7 years, 469 deaths occurred. The fully adjusted model was not significant (hazard ratio = 0.78, 95% confidence interval = 0.58–1.06). There was evidence that age was an effect modifier of the association between optimism and longevity. Higher optimism was associated with lower mortality risk in the oldest individuals only (77+ years; hazard ratio = 0.61, 95% confidence interval = 0.39–0.96).

Conclusions: We observed no independent relationship between optimism and all-cause mortality in the total sample, although optimism seemed to be associated with lower risk among the oldest old (adults 77 years and older).

Key words: dispositional optimism, mortality, effect modification, older adults, cohort study.

INTRODUCTION

In 2019, 703 million people globally were 65 years or older, and the proportion of those 65 years or older is predicted to increase from 1 in 11 people in 2019 to 1 in 6 people by 2050 (1). Aging is associated with an increased risk of chronic disease, such as cardiovascular disease, cancer, osteoarthritis, and dementia (2). With population aging across the world, the burden of chronic disease continues to grow (3). Psychological well-being may play an important role in mitigating the risk of chronic diseases in older age (4) and decreasing the risk of all-cause mortality (5). Positive psychological constructs, such as optimism, are increasingly recognized as being associated with better health outcomes in older adults (6).

There are two main theoretical perspectives that explain the nature of optimism, although there is no one accepted definition of optimism or standard instrument used to measure optimism (7). One theory suggests that optimism is a personality trait characterized by positive expectations for the future (dispositional optimism), whereas it is also proposed that optimism describes a characteristic way of explaining the causes of both positive and negative events (attributional optimism) (8–11).

Optimism has both a trait and state component, with the "trait" describing a relatively stable individual difference in level of optimism and "state" optimism being a level of optimism that is amenable to change according to context or situation (12). The heritability of optimism, at approximately 25%, is reported as being lower than the heritability of some other personality traits, including the "Big 5" (neuroticism, extraversion, openness for experience, conscientiousness, and agreeableness) (13,14). The results of a meta-analysis of randomized controlled intervention studies of optimism training indicate that psychological interventions can increase optimism, indicating that state optimism is modifiable (15).

Previous research has reported that optimism is associated with positive outcomes in cardiovascular disease (16), cancer (17), and immune function (18), as well as predicting lower pain classifications (19). Optimism has been associated with healthy aging (survival with functional ability that enables well-being with

ASPREE = *Asp*irin *R*educing *E*vents in the *E*lderly, **ALSOP** = ASPREE Longitudinal Study of Older Persons, **CI** = confidence interval, **LOT-R** = Life Orientation Test—Revised, **HR** = hazard ratio, **SES** = socioeconomic status

SDC Supplemental Digital Content

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age) in men and women (20,21) and with a greater likelihood of individuals surviving to 85 years of age (22). However, evidence is scarce on whether optimism assessed relatively late in the trajectory of life span is beneficial. Only two studies to date have included older individuals (65 years and older), with varying disease status and disability, and observed that higher optimism was associated with a lower risk of all-cause mortality. Whether levels of optimism in older individuals who reached later life in good health are beneficial is unknown. Therefore, the aim of this study was to explore the association between optimism and all-cause mortality among men and women 70 years and older living independently and free of cardiovascular disease, dementia, or major disability.

METHODS

Study Population

This study used data from the *As*pirin *R*educing *E*vents in the *E*lderly (ASPREE) study and the ASPREE Longitudinal Study of Older Persons (ALSOP) substudy. (23,24). Between 2010 and 2014, healthy older adults living in the United States or Australia and who were living independently and free of cardiovascular disease, dementia, or major disability were enrolled in the ASPREE. The ASPREE was a primary prevention trial to assess the effects of a daily dose of aspirin (24), and the major findings of the ASPREE study have been previously published (23,25,26).

The present study focuses on the Australian participants who were recruited through general practice with willing general practitioners (primary care physicians) acting as ASPREE coinvestigators and assessing their patients for suitability to take part in the study (27,28). The 16,703 Australian ASPREE clinical trial participants were also eligible to participate in the ALSOP substudy. ALSOP constituted a series of questionnaires at baseline and then biannually. The second baseline questionnaire was returned by 12,896 participants. Of these, 11,866 completed the Life Orientation Test—Revised (LOT-R), whereas complete data for the rest of the variables of interest for this study were available for 11,701 participants (Figure 1). The ALSOP participants were considered to be broadly representative of the population of older Australians who had reached the age of 70 years in relatively good health (24). ALSOP assessed overall health and life-style, as well as behavioral, social, economic, and environmental factors related to healthy aging (24).

Measures and Scales

Assessment of Optimism

The analysis of optimism was assessed through the LOT-R. The LOT-R consists of 10 items: three positively worded items, three negatively worded items, and four items that are not actually used to calculate the optimism score (known as filler questions). Controversy surrounds whether the LOT-R measures one factor (i.e., a unidimensional scale) or whether the LOT-R measures two distinct factors (i.e., optimism and pessimism) (29). The scale developers intended for all items to be pooled to provide a composite score of total optimism, so this approach was adopted in the current analyses (30). As per the recent study by Kim et al. (21), we chose to reduce burden to participants by omitting the filler questions and used the six-item version of the LOT-R, which has been found to have convergent and discriminant validity, and good test-retest reliability (29). For the purpose of this study, LOT-R scores (from 6 to 30) were divided into quartiles based on data distribution (21). Quartile 1 (Q1) included those with LOT-R scores ≤20; Q2, scores 21–24; Q3, scores 25–28; and Q4, scores 29–30, with higher scores representing greater optimism.

Assessment of Mortality

Mortality was an adjudicated end point for the primary analysis in the principal ASPREE study (23). ALSOP has no defined end point; mortality data

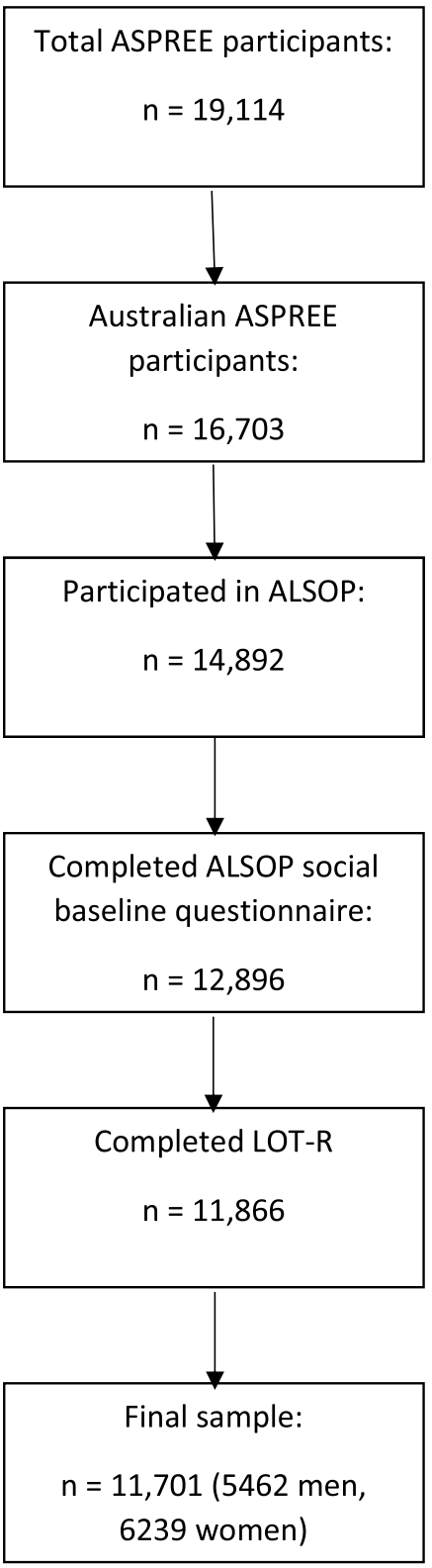

FIGURE 1. Flow diagram of selection of participants. ASPREE = *As*pirin *R*educing *E*vents in the *E*lderly; ALSOP = ASPREE Longitudinal Study of Older Persons; LOT-R = Life Orientation Test—Revised.

for the purpose of our analysis were sourced from ASPREE. The trial involved contact with study participants—by telephone (quarterly) and face-to-face (annually)—and clinical records were routinely examined. Therefore, death was generally identified through the course of the study. When participants were not able to be contacted, health records were reviewed; alternatively, the next of kin or other close contact notified the trial center of the death. Each death was confirmed by two independent sources (family, primary care physician, or public death notice). At the end of the trial, the names of all participants who had withdrawn or were lost to follow-up were linked to the National Death Index.

Potential Confounders

Confounders were selected a priori based on the available evidence of the variables commonly associated with both the exposure (optimism) and outcome (all-cause mortality), and all putative confounders were assessed before at the same time as the exposure.

Age was classified into four approximately equal categories (70–71.99, 72–73.99, 74–76.99, 77 years and older), to determine the potential modifying effect of age, and because when a continuous measure was used in the regression models, the proportional hazards assumption was not met. Binary variables were created for sex (women, men), living situation (living alone, living with others), education level (≤12 years, >12 years), smoking status (never having smoked, being a current or former smoker), daily alcohol use (low risk/never drank alcohol was defined as none or no more than 4 standard drinks in any 1 day *and* no more than 10 standard drinks in a week, compared with over this limit: not adherent) (31), and physical activity (rarely/never or light activity in a typical week as "not/less physically active," moderate or vigorous activity in a typical week as "physically active").

Statistical Analysis

Summary statistics were calculated, and the association between the sociodemographic variables and health-related behaviors with mortality was examined using χ^2 tests (Table 1). The relationship between optimism (exposure; LOT-R scores ranging between 6 and 30 were considered as the baseline level of optimism) and all-cause mortality (outcome) was assessed using the Cox proportional hazards models, and hazard ratios (HRs) and 95% confidence intervals (CIs) are reported (Table 2). We note the possibility that several of our potential confounding variables may be "overlapping" given that they tap into similar constructs and they are assessed at a similar time (32). Therefore, we tested whether the variables were intercorrelated by computing Spearman rank correlation coefficients

TABLE 1. Baseline Characteristics of 11,701 ALSOP Study Participants

	Total (n = 11,701), n (%)	Alive (n = 11,232), n (%)	Dead (n = 469), n (%)
LOT-R optimism score			
Q1 (≤20)	3197 (27.32)	3053 (27.18)	144 (30.70)
Q2 (21–24)	3239 (27.68)	3107 (27.66)	132 (28.14)
Q3 (25–28)	3050 (26.07)	2921 (26.01)	129 (27.51)
Q4 (29–30)	2215 (18.93)	2151 (19.15)	64 (13.65)
Age, y			
70–71.99	3475 (29.70)	3416 (30.41)	59 (12.58)
72–73.99	2504 (21.40)	2427 (21.61)	77 (16.42)
74–76.99	2545 (21.75)	2461 (21.91)	84 (17.91)
≥77	3177 (27.15)	2928 (26.07)	249 (53.09)
Sex			
Male	5462 (46.68)	5175 (46.07)	287 (61.19)
Female	6239 (53.32)	6057 (53.93)	182 (38.81)
Living situation			
Lives alone	3573 (30.54)	3397 (30.24)	176 (37.53)
Lives with others	8128 (69.46)	7835 (69.76)	293 (62.47)
Education level			
≤12 y	6781 (57.95)	6494 (57.82)	287 (61.19)
>12 y	4920 (42.05)	4738 (42.18)	182 (38.81)
Smoking status			
Never smoked	6494 (55.50)	6275 (55.87)	219 (46.70)
Current smoker	327 (2.79)	300 (2.67)	27 (5.76)
Former smoker	4880 (41.71)	4657 (41.46)	223 (47.55)
Alcohol use[a]			
Low risk/never drank alcohol	8750 (74.78)	8411 (74.88)	339 (72.28)
Not adherent (to NHMRC guidelines)	2951 (25.22)	2821 (25.12)	130 (27.72)
Physical activity			
Not/less physically active	3927 (33.56)	3719 (33.11)	208 (44.35)
Physically active	7774 (66.44)	7513 (66.89)	261 (55.65)

ALSOP = ASPREE Longitudinal Study of Older Persons; LOT-R = Life Orientation Test—Revised; Q = quartile; NHMRC = National Health and Medical Research Council.

[a] NHMRC guidelines for safe alcohol consumption in (Australian) adults: consuming ≤4 standard drinks on any 1 day and no more than 10 standard drinks in a week. Low risk is equivalent to adhering to NHMRC guidelines (31).

TABLE 2. The Association Between Optimism and All-Cause Mortality in 11,701 ALSOP Participants: The Results of the Cox Proportional Hazards Regression

	Q2 versus Q1		Q3 versus Q1		Q4 versus Q1	
	HR (95% CI)	*p*	HR (95% CI)	*p*	HR (95% CI)	*p*
Model 1 (crude)	0.90 (0.71–1.14)	.38	0.94 (0.74–1.19)	.59	0.63 (0.47–0.85)	**.002**
Model 2 (+ age, sex)	0.90 (0.71–1.14)	.38	0.98 (0.77–1.24)	.85	0.72 (0.54–0.97)	**.031**
Model 3 (+ living situation, education level)	0.92 (0.73–1.16)	.48	1.00 (0.79–1.27)	.98	0.74 (0.55–1.00)	.050
Model 4 (+ smoking status, alcohol use, and physical activity)	0.96 (0.76–1.22)	.73	1.05 (0.83–1.34)	.67	0.78 (0.58–1.06)	.11

Cox proportional hazards regression was used. LOT-R scores: Q1, ≤20; Q2, 21–24; Q3, 25–28; Q4, 29–30. Calibration (goodness of fit): model 1: $\chi^2 = 3.84$, $p = .15$; model 2: $\chi^2 = 17.63$, $p = .040$; model 3: $\chi^2 = 10.31$, $p = .33$; model 4: $\chi^2 = 22.04$, $p = .009$. Values in boldface are significant.

ALSOP = ASPREE Longitudinal Study of Older Persons; Q = quartile; HR = hazard ratio; CI = confidence interval; LOT-R = Life Orientation Test—Revised.

(Table S1, Supplemental Digital Content, http://links.lww.com/PSYMED/A771). Considering low correlation coefficients, all a priori selected putative confounders were retained in the model.

Model 1 was unadjusted, model 2 adjusted for age and sex, model 3 additionally adjusted for living situation and education level, and model 4 additionally adjusted for smoking status, alcohol intake, and physical activity. For each model in the Cox regression, the proportional hazard assumption was tested and found not to be statistically significant. We tested the goodness of fit of each Cox proportional hazards model using the Gronnesby and Borgan test (33).

To examine whether the relationship between optimism and mortality differed among age and sex categories, tests for interaction were performed by entering cross-product terms for each of the covariates and optimism into the Cox regression model. All regression models and summary statistics were performed in STATA version 15.0.

Ethical Approval

The project was reviewed and approved by the Monash University Human Research Ethics committee (reference number: 21906). All participants provided informed written consent before taking part in the ASPREE and ALSOP studies.

RESULTS

Baseline Participant Characteristics

A total of 11,866 individuals completed six items of the LOT-R, and complete data on the rest of the variables were available for 11,701 of these participants. Compared with participants with complete data, those who had some of the data points missing were more likely to be older, be a woman, live with others, have 12 years of formal education or less, and to have never smoked, and were less likely to be physically active (Table S2, Supplemental Digital Content, http://links.lww.com/PSYMED/A771). At baseline, the average (standard deviation) age of ALSOP participants was 75.1 (4.24) years, and there was a slightly higher proportion of women (53.3%). During the follow-up period (median = 4.7 years), 469 deaths occurred. Compared with the rest of participants, those who died during the follow-up were more likely to be in the highest age category, be a man, live alone, be either a current or former smoker, drink more than recommended safe levels of alcohol, and be less physically active (Table 1).

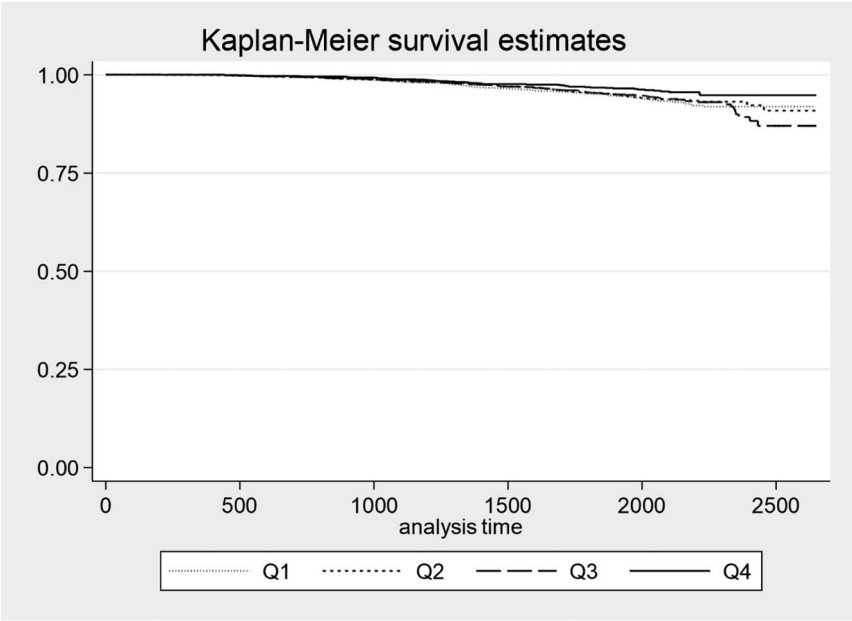

FIGURE 2. Kaplan-Meier survival curve for optimism of participants ($n = 11,701$) in quartiles. LOT-R scores: Q1, ≤20; Q2, 21–24; Q3, 25–28, Q4: 29–30. LOT-R = Life Orientation Test—Revised; Q = quartile.

The majority of participants scored greater than 25 on the LOT-R (Q3 or Q4), and 13.0% of all participants scored the maximum of 30.

Optimism and Risk of All-Cause Mortality

The most optimistic participants (top quartile) had a lower risk of mortality (HR [95% CI] = 0.63 [0.47–0.85], $p = .002$) compared with the least optimistic individuals (bottom quartile; Table 2; Figure 2). After further adjustment for age, sex, sociodemographic variables (living situation and education level), and health-related behaviors, the association between optimism and all-cause mortality was no longer statistically significant.

We explored whether age or sex modifies the association between optimism and all-cause mortality. Interaction analyses were conducted and found to be significant for age ($p < .001$) but not sex ($p = .61$). Subsequently, analyses were therefore stratified by age (Table 3). Among the oldest participants (77 years or older), in the fully adjusted model, the most optimistic participants (top quartile) had a lower risk of mortality compared with the least optimistic individuals (bottom quartile; HR [95% CI] = 0.61 [0.39–0.96]).

DISCUSSION

This study comprised 11,701 Australian older adults recruited through general medical practices, and it is the largest study of both men and women to determine whether optimism is a significant predictor of all-cause mortality in adults 70 years and older. The results of the study indicate that, over the 4.7-year median

TABLE 3. The Relationship Between Optimism and All-Cause Mortality Across Age Categories in 11,701 ALSOP Participants: The Results of the Cox Proportional Hazards Regression

		Q2 versus Q1		Q3 versus Q1		Q4 versus Q1	
	Deaths/*n*	HR (95% CI)	*p*	HR (95% CI)	*p*	HR (95% CI)	*p*
Model 1 (crude)							
70–71.99 y	59/3475	0.52 (0.24–1.10)	.087	0.58 (0.28–1.21)	.15	1.14 (0.60–2.16)	.68
72–73.99 y	77/2504	1.20 (0.66–2.21)	.55	1.31 (0.72–2.77)	.38	0.73 (0.34–1.57)	.42
74–76.99 y	84/2545	0.83 (0.47–1.47)	.52	1.13 (0.66–1.95)	.65	0.58 (0.28–1.21)	.14
≥77 y	249/3177	0.93 (0.68–1.27)	.63	0.89 (0.64–1.23)	.48	0.54 (0.34–0.84)	**.006**
Model 2 (+ sex)							
70–71.99 y	59/3475	0.53 (0.25–1.14)	.10	0.60 (0.29–1.25)	.17	1.26 (0.67–2.39)	.47
72–73.99 y	77/2504	1.20 (0.65–2.20)	.56	1.30 (0.71–2.36)	.39	0.79 (0.37–1.69)	.54
74–76.99 y	84/2545	0.83 (0.47–1.47)	.55	1.16 (0.67–1.99)	.60	0.61 (0.29–1.28)	.19
≥77 y	249/3177	0.94 (0.69–1.28)	.69	0.92 (0.67–1.28)	.64	0.57 (0.37–0.89)	**.014**
Model 3 (+ living situation, education level)							
70–71.99 y	59/3475	0.56 (0.26–1.20)	.14	0.66 (0.31–1.39)	.28	1.42 (0.74–2.73)	.29
72–73.99 y	77/2504	1.25 (0.68–2.31)	.47	1.38 (0.76–2.53)	.29	0.85 (0.39–1.84)	.68
74–76.99 y	84/2545	0.81 (0.46–1.45)	.48	1.11 (0.64–1.93)	.71	0.58 (0.27–1.21)	.15
≥77 y	249/3177	0.96 (0.70–1.32)	.82	0.95 (0.68–1.32)	.75	0.59 (0.37–0.92)	**.019**
Model 4 (+ smoking status, alcohol use, physical activity)							
70–71.99 y	59/3475	0.57 (0.26–1.21)	.14	0.71 (0.33–1.50)	.37	1.50 (0.78–2.89)	.22
72–73.99 y	77/2504	1.27 (0.69–2.33)	.45	1.40 (0.76–2.56)	.28	0.86 (0.40–1.88)	.71
74–76.99 y	84/2545	0.84 (0.47–1.49)	.55	1.21 (0.69–2.10)	.51	0.63 (0.30–1.33)	.23
≥77 y	249/3177	1.01 (0.74–1.38)	.96	0.99 (0.71–1.38)	.96	0.61 (0.39–0.96)	**.032**

Statistical test: Cox proportional hazards regression, stratified by age category. LOT-R scores: Q1, ≤20; Q2, 21–24; Q3, 25–28; Q4, 29–30. Values in boldface are significant.
ALSOP = ASPREE Longitudinal Study of Older Persons; Q = quartile; HR = hazard ratio; CI = confidence interval; LOT-R = Life Orientation Test—Revised.

follow-up, individuals in the highest category of optimism had a lower risk of all-cause mortality compared with those in the lowest category of optimism, after adjustment for age and sex. There was no association between optimism and mortality when living situation, education, and health-related behaviors were additionally adjusted for. However, for participants 77 years or older, the most optimistic participants had a lower risk of mortality compared with least optimistic participants in the fully adjusted model.

Two prior studies similarly reported that there was no significant relationship between optimism and all-cause mortality in older adults after adjustment for covariates. Anthony et al. (34) included 876 participants of comparable mean age to our study (74.1 and 75.1 years, respectively), and after a mean follow-up period of 8.1 years, they observed that with adjustment for age, optimism did not significantly predict all-cause mortality. Kubzansky et al. (16) also reported that with adjustment for multiple covariates, there was no significant association between optimistic explanatory style and all-cause mortality in a sample of 1306 men with a mean age 60.8 years. Our study and those of Anthony et al. (34) and Kubzansky et al. (16) were similar in that participants had access to publicly funded health care and were free of major chronic disease at baseline.

The results of our study are in contrast to findings of a Danish study on nonagenerians (35), which observed a negative association between optimism and all-cause mortality in women but not in men. Similarly, a study on Dutch men and women aged 65 to 85 years (36) also observed a negative association between optimism and all-cause mortality. However, the latter two studies recruited older men and women irrespective or disease or disability status, whereas we add to the current evidence by reporting the association between optimism and all-cause mortality exclusively in older adults who reached older age in good health. We also add to the findings of previous studies by additionally exploring the groups of older adults that could potentially benefit the most from interventions to increase optimism. We identified that among oldest old in our cohort (77 years and older), the most optimistic individuals, compared with less optimistic ones, had a lower risk of all-cause mortality.

Recent research into the developmental trajectory of optimism across the life span, has had mixed results. With a combined sample size of 74,866, a recent analysis of three panel studies reported that for samples from the United States and the Netherlands, optimism increased during younger adulthood and then plateaued during the midlife before declining in older age (37). The German sample, however, displayed inconsistent trends in terms of patterns across age groups and changes in optimism across the life span, with individuals increasing in optimism as they aged (37), and the authors proposed that this result possibly reflected cohort effects or factors specific to the sample.

Sociodemographics and health-related behaviors explained the association between optimism and mortality, although not for the oldest participants. According to the results of the English Longitudinal Study of Ageing and the US Health and Retirement Study, higher socioeconomic status (SES) is associated with longer life free from disability (38). Among older adults, lower SES is associated with engaging in less healthy behaviors (39), and individuals of lower SES are less optimistic compared with their more affluent counterparts (40). Optimism is associated with more positive health behaviors, which in turn promote reduced mortality risk (41). Optimists' tendency to use problem-focused coping and self-belief that their goals are attainable also means that they are more likely to change health behavior (42,43). Optimists are more likely to engage in regular physical activity (44), eat a nutrient-rich diet (45), and abstain from smoking (46). Optimism is also positively related to quality of sleep (30).

Emerging research (47) suggests that positive psychological interventions that increase well-being may lead to improved engagement in health-related behaviors in cardiac patients (such as doing moderate-to-vigorous physical activity). However, it remains unclear whether increasing optimism specifically (with a psychological intervention) may result in increased health-promoting behaviors in nonpatient populations, such as by encouraging less smoking, moderate consumption of alcohol, improved diet, and increases in physical activity. To determine whether there is a causal effect of optimism on mortality, a randomized trial could be done to assess whether a psychological intervention that is effective in promoting higher levels of optimism also confers a lower risk of all-cause mortality.

Inherent in the study were some limitations. Volunteering for a long-term trial (such as the ASPREE/ALSOP study) is likely to attract people with particular characteristics, including optimism (as evidenced by the skew in optimism scores for our cohort). Another limitation was that data on diet quality were not available, which is a factor that has been associated with optimism (45) and mortality (48). Although the sample was considered to be representative of Australian adults who had reached the age of 70 years in relatively good health, the ALSOP cohort had very few non-White participants, and all were community-dwelling older adults free of disabling chronic disease at baseline. The fact that the participants were in reasonably good health at baseline may also have contributed to the relatively lower percentage of deaths (4%), although this may also have been due to the relatively short length of follow-up time (median = 4.7 years). This low rate of mortality may have affected our statistical results by reducing the magnitude of the effect size. We also note that the lack of clinically significant variation in the LOT-R scores (primary exposure) may have contributed to our null finding.

Our sample consists exclusively of adults 70 years and older who were free of major disease or disability, which allowed us to explore the question of whether optimism is associated with a reduced risk of mortality for older adults in relatively good health. However, we acknowledge the potential selection bias in that individuals with the lowest levels of optimism may have died before 70 years and thus were not represented in the current study. This healthy survivor effect may have contributed to the null finding in the overall cohort of adults 70 years and older. Furthermore, reverse causality may also be a factor to consider—that people with better health are more optimistic; this seems plausible given the ceiling effect of the LOT-R scores in our cohort. It has also been argued that the beneficial effects of optimism have a cumulative effect across the life span (49); however, our model is limited to only capturing approximately 4 years of each participant's life.

Promoting optimism may improve health-related behaviors such as engaging in physical activity and not smoking (44,46). Therefore, it is possible that health behaviors may mediate, rather than confound, the relationship between optimism and all-cause mortality. By treating health-related behaviors as confounders, we may have overadjusted our analyses and removed some of the effect of optimism on all-cause mortality that goes via health-

related behavior pathways. However, this approach enabled us to explore whether the relationship between optimism and all-cause mortality was independent of differences in health-related behaviors.

Despite the limitations, this is among the largest studies of both men and women to determine whether optimism is a significant predictor of all-cause mortality in adults 70 years and older living independently and free of cardiovascular disease, dementia, or major disability. Our study also adds evidence for a modifying effect of age on the association between optimism and mortality in older adults. The sample is considered to adequately represent those older individuals in Australia who have reached the age of 70 years in relatively good health (24). We used the LOT-R to measure optimism, which is well researched and validated.

CONCLUSIONS

Among 11,701 adults 70 years and older, we observed no independent relationship between optimism and all-cause mortality in the total sample, although age at study entry seemed to moderate the effect of optimism on mortality, with the oldest adults (77 years and older) living longer when more optimistic. Future research is warranted to clarify correlates of optimism and explore the trajectory of optimism throughout the latter years or life—because it seems from our findings that in oldest old, optimism may contribute to lowered risk of mortality.

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