Meaning in Life and Its Relationship With Physical, Mental, and Cognitive Functioning:

A Study of 1,042 Community-Dwelling Adults Across the Lifespan

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ABSTRACT

Objective: To examine the relationship of presence and search for meaning in life with age, physical and mental well-being, and cognitive functioning across the adult lifespan.

Methods: Cross-sectional data from 1,042 adults in the Successful AGing Evaluation (SAGE)—a multicohort study of adult community-dwelling residents of San Diego County, California—were analyzed. Presence of meaning ("Presence") and search for meaning in life ("Search") were assessed with the Meaning in Life Questionnaire. Physical and mental well-being were measured using the Short Form 36 Health Survey (SF-36). Telephone Interview for Cognitive Status—modified was employed to screen for overall cognitive function. Study data were collected from January 2013 to June 2014.

Results: Presence of meaning exhibited an inverted U-shaped relationship whereas Search showed a U-shaped relationship with age (with Presence peaking and Search reaching the lowest point around age 60). Statistical modeling using generalized estimating equations revealed that physical well-being (SF-36 physical composite score) correlated negatively with age ($P < .001$) and positively with Presence ($P < .001$), and there was an age group x Presence interaction ($P = .018$), such that the relationship was stronger in subjects over age 60. Mental well-being correlated positively with age ($P < .001$) and Presence ($P < .001$) and negatively with Search ($P = .002$). Cognitive function correlated inversely with age ($P < .001$) and with Search ($P < .001$). Significant covariates of Presence and Search had small effect sizes, except for a medium effect size for satisfaction with life and Presence in adults over age 60 ($P < .001$).

Conclusions: Presence and search for meaning in life are important for health and well-being, though the relationships differ in adults younger and older than 60 years. Better understanding of the longitudinal relationships of meaning of life with well-being is warranted to design interventions to increase meaning of life and improve health and functioning.

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Over the last 3 decades, meaning in life has emerged as an important focus of study in medical research, especially in the context of the aging population. A body of literature on this subject shows that individuals who perceive their lives to be more meaningful have better outcomes across a wide variety of psychological and physical measures of health and well-being.[1–4] A recent US cohort study of nearly 7,000 older adults demonstrated that stronger purpose in life was associated with lower mortality.[5]

One popular instrument to assess meaning in life is the Meaning in Life Questionnaire (MLQ) by Steger et al,[4] a scale with good psychometric properties that has been successfully validated and applied in various cultural settings across the world. It assesses 2 different dimensions of meaning in life: presence of meaning (hereafter, "Presence") and search for meaning ("Search"). Presence refers to the perception that one's life is meaningful. Search refers to an active pursuit of meaning in one's life.

The relationship between age and meaning in life has been examined in a number of prior reports.[1,4,6,7] Existing literature generally suggests that Presence increases with age and Search decreases with age, and there is an inverse relationship between Presence and Search, but the results have not always been consistent across studies.[1,3,4,6–8] These studies also suggest a positive association of presence of meaning and a negative association of search for meaning with mental functioning.[1,3,4,6–8] The positive association of meaning in life with physical functioning has also been extensively investigated in the literature.[2] While multiple studies have examined the relationship with physical and mental functioning, the association of meaning in life and cognitive functioning is less well studied in cognitively unimpaired adults.

A noteworthy limitation of existing research in this area is the underrepresentation of older subjects. For instance, in one frequently cited study of meaning across the lifespan with a large sample of nearly 8,800 subjects, only 163 subjects (1.8%) were 65 years of age or older.[4] Many other studies either excluded older subjects or included very few of them.[1,7] Nearly all of these studies also restrict their analyses to linear relationships, and the possibility of nonlinear

Clinical Points

- The relationship of presence of and search for meaning in life across the adult lifespan with physical, mental, and cognitive functioning is complex and poorly characterized.
- Presence of meaning in one's life is linked with better physical and mental functioning; actively searching for meaning is associated with poor mental and cognitive functioning.
- Meaning in life is a potentially modifiable factor that can be targeted by clinicians and researchers to enhance the well-being and functioning of patients.

relationships is not explored.[4,6,7] Many studies also create arbitrary age categories that further restrict analysis.[4,7]

In the present study, we sought to remedy some of these limitations. We used cross-sectional data from the Successful AGing Evaluation (SAGE) study, which includes a community-dwelling sample of randomly selected individuals across the entire adult lifespan.[9,10] We used MLQ to assess meaning in life. We hypothesized that presence of meaning would be associated with better physical, mental, and cognitive functioning. We explored the relationship of search for meaning to functioning as the literature on Search is far less uniform than that on Presence. In addition, we explored the relationship of meaning in life with age and other sociodemographic factors.

METHODS

Participants

The SAGE study used a structured multicohort longitudinal design to recruit 1,300 community-dwelling residents of San Diego County, California, from age 21 to 100+, with an oversampling of people over age 75 because of their underrepresentation in the published literature as well as a greater risk of dropouts due to death and disability. Inclusion criteria for SAGE were (1) age 21 or older, (2) a (landline) telephone in the home, (3) physical and mental ability to participate in a telephone interview and to complete an online or paper-and-pencil mail survey, (4) informed consent for study participation, and (5) English fluency. Participants were excluded if they resided in a nursing home or needed daily skilled nursing care, reported a formal diagnosis of dementia made by a clinician, and/or had a terminal illness or need for hospice care. The study was approved by the Human Research Protections Program at University of California San Diego. The sample was recruited using random digit dialing on landline home telephones. Cognitive assessments were conducted using a brief telephone interview, while other instruments were sent to the participants using postal or electronic mail. More details about the SAGE study methodology have been reported previously.[9] The MLQ was added to the SAGE study with the 2013 follow-up survey. The current study included cross-sectional data from 1,042 adults who had completed the MLQ from January 2013 through June 2014.

Measures

Sociodemographic information (age, gender, education, race/ethnic background, and marital status) was collected via self-report as part of the SAGE survey.

Meaning in Life Questionnaire. The MLQ[8] is a 10-item self-report questionnaire to measure meaning in life. It has 2 subscales, Presence of Meaning and Search for Meaning. Each item is rated from 1 (absolutely untrue) to 7 (absolutely true) by the respondents, leading to a possible total score range of 5 to 35 for both Presence and Search (5 items each). The 2-factor structure has been replicated multiple times, and both subscales have good internal consistency (Cronbach alphas between 0.82 and 0.88) and test-retest stability.[3,8]

Subjective Physical and Mental Well-Being (Quality of Life). Physical and mental well-being (quality of life) was measured using the Short Form 36 Health Survey (SF-36),[11] which is a self-report of general health divided into a physical component summary and mental component summary. The SF-36 was designed as a measure of health-related quality of life or well-being, and it has been used in research as a measure of individuals' perception of their own health status. Norm-based scores are placed on the same metric with a mean of 50 (reflecting mean for the US general population) and standard deviation of 10. Scores above 50 reflect higher functional status than the average population and vice versa.

Telephone Interview for Cognitive Status—Modified. During a 25-minute structured phone interview, trained study staff administered the 12-item modified version of the Telephone Interview for Cognitive Status (TICS-m).[12] The TICS-m has been validated in several studies and is a reliable screening instrument for cognitive impairment. It has a score range of 0–50, with higher scores indicating better cognitive performance.

Other measures. Other validated questionnaires used in the study were Self-Rated Successful Aging,[13] Life Orientation Test-Revised[14] (Optimism), Perceived Stress Scale,[15] Personal Mastery Scale[16] Brief Symptom Inventory Anxiety Scale,[17] Patient Health Questionnaire 9-item[18] Severity Score (Depression), Connor-Davidson 10-item Resilience scale,[19] Santa Clara Brief Compassion Scale,[20] Brief Multidimensional Measure of Religiousness/Spirituality,[21] Life Events Scale,[22] Center for Epidemiologic Studies Depression Scale (Happiness),[23] Satisfaction with Life Scale,[24] Neff Self-Compassion Scale,[25] Adult Hope Scale,[26] and Social Support Index.[27] Body mass index was calculated from height and weight as kilograms per square meter. Subjects were also asked to report hours of sleep per night, current alcohol use and number of alcoholic drinks on a typical day, and smoking status.

Statistical Analysis

We used scatterplots and fit lines to assess for linearity of relationship between MLQ and age. Based on the plot between MLQ subscale scores and age, we decided to use 61 years as a cutoff point to divide the sample into younger

Table 1. Descriptive Characteristics of Study Subjects

	Younger Group (<61 Years) (n=404)		Older Group (≥61 Years) (n=638)		Statistics		
	Mean or N	SD or %	Mean or N	SD or %	χ^2 or t[a]	*df*	*P*
Demographics							
Age, y	42.8	11.3	80.1	10.1	…	…	…
Gender (female)	231	57.2%	294	46.1%	12.2	1	<.001
Race							
Caucasian	276	68.3%	522	81.8%	28.95	4	<.001
African American	6	1.5%	7	1.1%			
Hispanic	73	18.1%	66	10.3%			
Asian	43	10.6%	31	4.9%			
Other	6	1.5%	8	1.3%			
Marital status (currently married)	235	58.2%	330	51.7%	3.56	1	.063
Education (college and above)	361	89.4%	508	79.6%	16.6	2	<.001
Employment (employed full/part time)	320	79.2%	95	14.9%	442.9	2	<.001
Household income (≥ $75,000)	213	52.7%	203	31.8%	46.9	2	<.001
Meaning in life (MLQ)							
Presence subscale	27.1	6.1	26.48	5.6	1.71	1,021	.088
Search subscale	19.4	8.1	18.55	7.6	1.59	1,020	.113
Measures of physical, mental, and cognitive health							
Physical health (SF-36)	52.0	7.6	42.88	11.3	15.4	1,014.0	<.001
Mental health (SF-36)	49.8	9.7	54.47	8.5	7.81	773.7	<.001
Global cognitive function (TICS-m)	37.1	4.2	33.79	4.9	11.5	955.2	<.001
Covariates of interest							
Self-rated successful aging	7.6	1.9	7.76	3.1	1.08	1,037.8	.333
Body mass index	27.1	5.9	25.49	4.4	4.54	686.9	<.001
No. of alcoholic drinks on a typical day							
1 drink	139	34.4%	264	41.4%	23.6	2	<.001
2–4 drinks	122	30.2%	126	19.7%			
>4 drinks	24	5.9%	12	1.9%			
Current alcohol use	314	77.7%	443	69.4%	7.565	1	.006
Hours of sleep per night	6.94	1.17	7.38	3.38	2.42	973	.016
Optimism (LOT-R)	22.9	4.34	23.24	3.62	1.34	747.3	.164
Perceived stress (PSS)	13.9	6.77	11.4	5.56	6.20	734.2	<.001
Personal mastery (PMS)	22.3	3.96	21.4	3.6	3.97	795.5	<.001
Anxiety (BSIAS)	2.53	3.55	1.6	2.52	4.56	652.7	<.001
Depression (PHQ-9)	3.69	4.11	2.65	3.32	4.23	719.0	<.001
Resilience (CD-RISC)	29.8	6.52	30.3	5.85	1.25	1,008	.211
Compassion (SCBCS)	4.9	1.29	4.9	1.28	0.23	1,020	.818
Daily spirituality (BMMRS)	21.4	9.43	20.1	8.85	2.20	790.2	.026
Religiosity (BMMRS)	5.28	1.77	4.99	1.74	2.55	1,009	.011
Life events over past year (LES)	3.02	3.29	2.8	2.98	1.08	995	.282
Happiness (CESD)	9.35	2.76	10.0	2.48	3.85	789.2	<.001
Satisfaction with life (SWLS)	23.7	6.66	25.5	5.79	4.28	759.8	<.001
Self-compassion (Neff)	40.4	8.25	43.4	7.18	5.99	765.4	<.001
Social support (SSI)	47.3	9.3	49.6	7.67	4.07	731.9	<.001
Hope (AHS)	52.4	8.0	51.7	7.96	1.36	1,001	.175
Current smoker (yes)	31	7.7%	26	4.1%	37.2	1	<.001

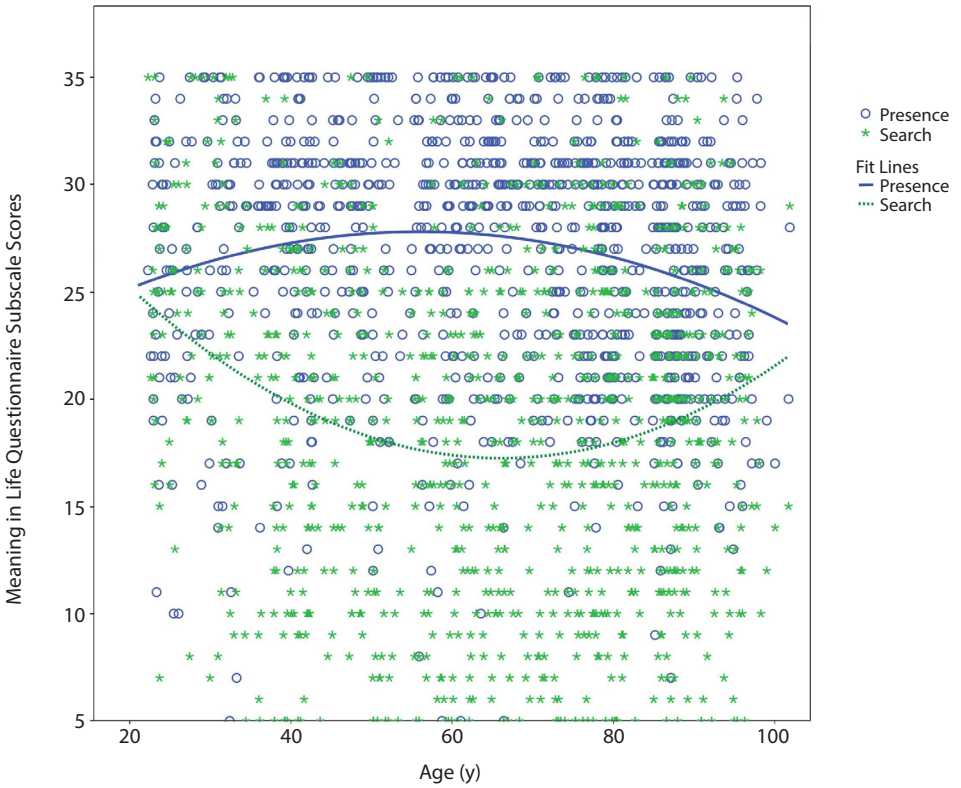
[a] *t* test for continuous variables and χ^2 for categorical variables.

Abbreviations: AHS = Adult Hope Scale, BMMRS = The Brief Multidimensional Measure of Religiousness/Spirituality, BSIAS = Brief Symptom Inventory Anxiety Scale, CD-RISC = Connor Davidson Resilience Scale (10-item), CESD = Center for Epidemiologic Studies Depression scale, LES = Life Events Scale, LOT-R = Life Orientation Test-Revised, MLQ = Meaning in Life Questionnaire, Neff = Neff Self-Compassion Scale, PHQ-9 = Patient Health Questionnaire 9-item, PMS = Personal Mastery Scale, PSS = Perceived Stress Scale, SCBCS = Santa Clara Brief Compassion Scale, SF-36 = Short Form 36 Health Survey, SSI = Social Support Index, SWLS = Satisfaction with Life Scale, TICS-m = Telephone Interview for Cognitive Status, modified.

and older age groups (younger: age < 61, older: age ≥ 61). The vertex of estimated parabola of Presence subscale is about age 56 and that for Search subscale is at about age 66; age 61 is, therefore, a reasonable cutoff point to compare age-specific relationships between MLQ subscales and physical, mental, and cognitive functioning. These two age groups were compared using *t* tests and χ^2.

We used Spearman correlations of MLQ subscales with age, physical functioning, mental functioning, and cognitive functioning to determine statistically significant bivariate correlations, and these relationships were then further tested for significance using generalized estimating equations (GEE) models. We used GEE instead of multiple regression as it has the advantage of not imposing any assumption on the structure of the variance of data and thus provides a more robust inference. We used GEE models to explore the age-specific relationships of Presence and Search with physical, mental, and cognitive functioning. Age group × Presence and age group × Search were also included in the GEE model to explore the existence of an interaction effect between age group and Presence/Search subscale scores. With health variables as outcomes, we used age, Presence, Search, age group × Presence, and age group × Search as independent variables (3 models).

Figure 1. Plot of Age and Meaning in Life (Presence and Search)



Identification of factors associated with Presence and Search in our sample was conducted using group backward stepwise selection (GBSS): all levels of a categorical variable were considered as a group and were included or excluded together by backward stepwise selection. In addition to demographic variables, this analysis included all measures and validated questionnaires described above. Measures were identified for inclusion in this analysis based on a review of existing literature for variables that might have a potential relationship with Presence and Search. Variance inflation factor (VIF) was checked for each covariate in linear models at 2 stages. First, covariates with VIF > 3 were excluded to prevent high multicollinearity, then a group-based backward stepwise selection was performed on the remaining variables in the GEE model. Variables with the highest *P* value were systematically removed and new GEE models rebuilt, until all the remaining variables had a *P* value < .2. Second, to be more conservative, variables with VIF > 2 were removed, and then we rebuilt the final GEE model. We built 4 separate GEE models for the following 4 outcomes: "Presence in Younger Adults," "Presence in Older Adults," "Search in Younger Adults," and "Search in Older Adults." Variables with *P* values ≤ .05 were then identified in the model. Partial η^2 was calculated for these covariates as a measure of effect size. Covariates with very small effect sizes (partial $\eta^2 < 0.015$) were excluded from the final results.

As we were exploring relationships among different outcomes, we did not apply weights in our analysis based on oversampling. Oversampled age groups had the same contributions as other age groups.

RESULTS

Table 1 summarizes the characteristics of the study sample divided into younger and older age groups. These two groups differed significantly from each other on most variables except for a few, including MLQ. Mean age of the overall sample was 65.6 years (SD = 21.1). The mean Presence score of 26.7 (SD = 5.8) and mean Search score of 18.9 (SD = 7.8) were above and below the midpoint of 20,[4] respectively, indicating that on the whole, our study subjects found their lives to be meaningful and had a low degree of active search for meaning. Mean physical and mental well-being (based on SF-36 physical and mental components) were rated as 46.5 (SD = 11.0) and 52.6 (SD = 9.3), respectively, and were fairly close to 50, which reflects the mean for the US general population.[11] Cognitive functioning (TICS-m) mean score was 35.1 (SD = 4.9) for the sample, well above the suggested cutoff score of 27 to screen for dementia.[28]

Relationship of Presence and Search With Age

Figure 1 shows MLQ Presence and Search subscales scores plotted against age. Both Presence and Search showed a U-shaped relationship with age—ie, Presence exhibited an inverted U-shaped curve and Search showed a U-shaped curve. This relationship was not linear, and the line of best

Table 2. Age-Specific Spearman Correlations Between Meaning of Life (Presence and Search) With Clinical Factors

		Presence Subscale	Search Subscale
Younger age group (<61 years)			
Search subscale	*r*	−0.328**	…
	P	<.001	…
	n	399	…
Age	*r*	0.070	−0.332**
	P	.160	<.001
	n	401	399
Physical health (SF-36)	*r*	0.100*	0.049
	P	.046	.327
	n	399	398
Mental health (SF-36)	*r*	0.325**	−0.266**
	P	<.001	<.001
	n	399	398
Global Cognitive functioning (TICS-m)	*r*	0.053	−0.072
	P	.292	.152
	n	401	399
Older age group (≥61 years)			
Search subscale	*r*	−0.066	…
	P	.101	…
	n	618	…
Age	*r*	−0.207**	0.068
	P	<.001	.091
	n	622	623
Physical health (SF-36)	*r*	0.276**	−0.06
	P	<.001	.139
	n	604	604
Mental health (SF-36)	*r*	0.245**	−0.210**
	P	<.001	<.001
	n	604	604
Global Cognitive functioning (TICS-m)	*r*	0.120**	−0.106**
	P	.003	.008
	n	622	623

*Correlation is significant at the .05 level.
**Correlation is significant at the <.01 level.
Abbreviations: SF-36 = Short Form 36 Health Survey, TICS-m = Telephone Interview for Cognitive Status, modified.

fit followed quadratic function. A GEE quadratic model showed that the difference between Presence and Search in relationship with age was significant ($P<.001$)—ie, the two curves are significantly different from each other.

Spearman correlations between age and MLQ subscale scores (Table 2) revealed a significant negative association between age and Search in the younger group and a significant negative correlation between age and Presence in the older age group.

Age-Specific Relationships of Presence and Search With Physical, Mental, and Cognitive Functioning

In the younger age group, there was a significant negative correlation between Presence and Search (Table 2). Subjective physical well-being (SF-36 physical composite score) correlated positively with Presence. Mental well-being (SF-36 mental composite score) correlated positively with Presence and negatively with Search, while cognitive function (TICS-m) did not show a significant relationship with either.

In the older age group, the correlation between Presence and Search was not significant. Presence correlated with better physical well-being and showed greater strength of correlation compared to the younger group; correlation with Search remained nonsignificant. Higher Presence was associated with better mental well-being (SF-36 mental composite score), and Higher Search was associated with worse mental well-being. Cognitive function (TICS-m) showed a positive correlation with Presence and a negative correlation with Search, but the strength of the correlation was weak.

In summary, Presence correlated positively with physical and mental well-being in both younger and older groups, as well as positively with cognitive functioning in the older group. Search correlated negatively with mental functioning in both age groups and negatively with cognition in the older group.

GEE Models for Relationship of Presence and Search With Physical, Mental, and Cognitive Functioning

Physical well-being (SF-36 physical composite score) was negatively correlated with age ($P<.001$) and positively with Presence ($P<.001$), and there was a significant age group × Presence interaction ($P=.018$), such that the relationship was stronger in the older age group.

Mental well-being (SF-36 mental composite score) was positively correlated with age ($P<.001$) and Presence ($P<.001$) and negatively correlated with Search ($P=.002$), and there was no significant age group × Search interaction.

Cognitive function (TICS-m) was negatively correlated with age ($P<.001$) and with Search ($P<.001$), with no significant association with Presence, age group × Presence, or age group × Search.

Factors Associated With Presence and Search

The results of the GBSS are summarized in Table 3. Significant covariates were generally of small effect size. The only covariate with a medium effect size was satisfaction with life for Presence in older adults. GBSS showed both commonalities and differences between younger and older adults. For Presence, satisfaction with life, life events scale, and compassion emerged as common variables. Alcohol consumption emerged as a significant covariate of Presence in younger adults, and cigarette smoking, in older adults. No common covariates emerged for Search in younger or older adults.

DISCUSSION

In our sample of 1,042 community-dwelling adults in San Diego, Presence and Search showed a nonlinear, quadratic relationship with age across the adult lifespan. Presence correlated positively with physical and mental well-being, and Search correlated negatively with mental well-being and cognitive functioning.

Prior research examining the relationship between meaning in life and age has generally reported that Presence increases and Search decreases with age. We found a U-shaped relationship between age and meaning with inclusion of substantial numbers of older subjects and by allowing

Table 3. Factors Significantly Associated With Presence and Search

Covariate	Direction of Association	Effect Size (η_p^2)	Estimate β	Robust Standard Error	Robust *Z*	GEE Model *P* Value
Presence in younger adults (n = 279)						
2–4 alcoholic drinks per day	Negative	0.025 (small)	−2.063	0.720	−2.86	.004
Happiness (CESD)	Positive	0.064 (small)	0.586	0.171	3.43	< .001
Satisfaction with life (SWLS)	Positive	0.072 (small)	0.252	0.059	4.26	< .001
Life Events Scale	Positive	0.015 (small)	0.192	0.089	2.16	.031
Compassion (SCBCS)	Positive	0.029 (small)	0.651	0.240	2.72	< .001
Presence in older adults (n = 301)						
No. of cigarettes smoked/d (current or past)	Negative	0.030 (small)	−0.066	0.021	−3.05	.002
Satisfaction with life (SWLS)	Positive	0.160 (medium)	0.387	0.071	5.50	< .001
Optimism (LOT-R)	Positive	0.090 (small)	0.429	0.087	4.94	< .001
Life Events Scale	Positive	0.015 (small)	0.192	0.095	2.02	.044
Compassion (SCBCS)	Positive	0.036 (small)	0.663	0.213	3.11	.002
Search in younger adults (n = 277)						
Marital status (married)	Negative	0.045 (small)	−3.369	0.935	−3.60	< .001
Self-compassion (Neff)	Negative	0.035 (small)	−0.200	0.070	−2.86	.004
Compassion (SCBCS)	Positive	0.023 (small)	0.901	0.330	2.73	.006
Search in older adults (n = 302)						
Hours of sleep per night	Positive	0.016 (small)	0.215	0.047	4.62	< .001
No. of current cigarettes/d	Negative	0.031 (small)	−0.773	0.117	−6.60	< .001

Abbreviations: CESD = Center for Epidemiologic Studies Depression scale, GEE = generalized estimating equations quadratic model, LOT-R = Life Orientation Test-Revised, Neff = Neff Self-Compassion Scale, SCBCS = Santa Clara Brief Compassion Scale, SWLS = Satisfaction with Life Scale.

for the possibility of nonlinear relationships. This inverse relationship between Presence and Search for meaning in life with reference to age makes intuitive sense. If a person lives with a sense of purpose and meaning, s/he does not need to be engaged in searching for additional meaning.[29] Conversely, if a person feels a void of meaning in life, s/he would want to actively seek purpose.[29] Our results indicate that Presence increases with age, but only up to a point. With advancing age, the declining physical health and cognition may have a negative impact on the sense of meaning in one's life.[30] As health worsens and Presence declines, one may feel that life is less meaningful and, therefore, feel an urge to search for meaning in an increasingly constricted life.[29,30]

In our sample, Presence positively correlated with physical and mental well-being, and Search negatively correlated with mental well-being and cognitive function. These findings are consistent with prior literature in terms of both the direction and the strength of associations. A meta-analysis of 66 studies found weak-to-moderate associations (the overall estimate of the average effect = 0.258) between meaning in life and physical health.[2] The strongest associations were found for subjective indicators of physical health. The correlation between physical health and Presence was of a similar magnitude (0.276) in our study for elderly subjects. The positive association of Presence with mental health functioning and negative association with Search have been similarly described in several prior studies.[1,3,4,6–8]

Existing literature is relatively sparse on the relationship of meaning in life with cognition. Lewis et al[31] reported that purpose of life—measured using Ryff Scales of Psychological Well-being—was significantly associated with cognitive functioning (global cognition as well as executive functioning and episodic memory, measured via telephone-based cognitive assessment) in individuals across the adult lifespan (N = 3,489, mean age = 56.4 years; range, 32–84 years). We are not aware of published research examining association of cognition with Presence and Search for meaning using MLQ. While we found a positive correlation of cognition with both Presence and Search in bivariate analyses, GEE modeling demonstrated a significant relationship only with Search. As this was a cross-sectional analysis, it is unclear if higher cognition directly or indirectly leads to lower Search for meaning, or if higher Search for meaning serves as a risk factor for lower cognition (for instance, via lifestyle factors such as smoking and substance use or biological mechanisms such as higher inflammatory cytokines).

The magnitude of associations in our study is generally low to moderate, which is also consistent with prior research.[1,3,4,6–8] While one may be tempted to dismiss the clinical meaningfulness of these associations based on the strength of correlations, it is important in the context that many psychiatric interventions have small effect sizes in rigorously analyzed studies but have meaningful effects on short-term outcomes in patients in clinical care.[32,33] As Presence and Search are potentially modifiable, this presents an opportunity to alleviate suffering and distress.

Our findings have several potential implications for efforts to understand and enhance health outcomes. People with low presence of meaning in their lives and/or those with high search for meaning may possibly be at higher risk of poor physical, mental, and cognitive outcomes, and assessment of meaning in life could be a way of identifying vulnerable populations. High levels of search for meaning may be an indication that the individual is experiencing difficulties adjusting with declining functioning, and one can hypothesize that interventions targeting such individuals may help them cope with their stressors and allow for flourishing with a sense of purpose.

Satisfaction with life, optimism, compassion, happiness (in younger adults only), alcohol consumption (younger adults only), and cigarette smoking (older adults only) emerged as significant covariates for Presence in our sample, and marital status (younger adults only), compassion (younger adults only), self-compassion (younger adults only), sleep (older adults only), and cigarette smoking (older adults only), as significant covariates for Search. Several of these variables have been associated with meaning in life in existing literature[4,7,34–38]; however, their specific associations with Presence or Search with respect to age have not been reported before. Our findings, therefore, add to the existing literature and should be a basis for further research with regard to replication and elaboration of causality of these factors.

In recent years, there has been growing literature on the value of positive psychosocial factors such as resilience, optimism, wisdom, and meaning in life for enabling improved mental, physical, and cognitive function as well as longevity.[39,40] These factors are a critical part of the conceptualization of positive psychiatry.[41] Psychiatry and medicine have long focused on illnesses and pathology. It is important that we pay equal attention to mental health and well-being. The latter goes beyond hedonic well-being and must consider eudemonic well-being, exemplified by purpose in life. Promoting wellness and happiness through enhancement of positive factors should be the goal of health care rather than merely control of symptoms with medications.

Strengths of the study include large sample size across the entire adult lifespan, adequate representation of the very old adults, use of validated instruments, statistical modeling using GEE, and identification of covariates employing GBSS. At the same time, several limitations of our study should also be pointed out. Physical and mental well-being were measured using a self-report instrument and may not correspond to objective health status. However, several investigations have shown objective validity of subjective reports of health and well-being.[42,43] The split of age groups was done post hoc in our analysis based on the scatterplot. This was a cross-sectional analysis, so inferences of causality cannot be drawn. The study included only subjects with a landline telephone and therefore may not be generalizable to other samples without a home phone. Our sample was restricted to San Diego area residents and may not represent non-Californians. The MLQ focuses mostly on the self, and not on the self in relation to others. For this reason, the questionnaire may not adequately capture the altruistic aspects of meaning in life that Viktor Frankl emphasized in his work on logotherapy.[44]

Future research should examine longitudinal relationships of Presence and Search with age, physical and mental well-being, and cognitive functioning and attempt to discover moderators and mediators of these relationships. Given the emerging insights into the biology of various aspects of positive aging such as resilience and optimism,[45] investigations into biomarkers of meaning in life may be worth pursuing. Indeed, Cole and colleagues[46] reported a relationship between eudemonic well-being and conserved transcriptional response to adversity gene expression. Finally, a number of psychosocial interventions have demonstrated an increase in meaning in life in various populations such as individuals with advanced physical diseases, alcohol use, cancer, and dementia.[34,37,47,48] This suggests the need for clinical trials to rigorously investigate the efficacy of interventions aimed at increasing meaning, especially at the two ends of the adult age-span as well as in people with physical, mental, or cognitive impairment.

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