The Power of the Mind:
Emotional Well-Being and Mortality Risk among Older Men and Women in Japan

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Abstract

This research examines the relationship between emotional well-being and all-cause mortality among older persons aged 65 and over in Japan. We pay particular attention to how the three positive items from the Center for Epidemiologic Studies Depression Scale (CES-D) – feeling happy, enjoying life, and feeling hopeful about the future – are associated with the risk of mortality over the four-year study period. Analyses of three waves of data from the Nihon University Japanese Longitudinal Study of Aging (1999, 2001, and 2003) lead to several important conclusions. First, positive affect is inversely associated with mortality risk in the overall population. Yet, the effects of feeling happy and enjoying life disappear with the addition of health status, sociodemographic, behavioral, and relational factors. On the other hand, the protective effects of feeling hopeful continue to be robust, net of all controls. Second, the impacts of psychological factors considerably differ by gender. A sense of hope offers protection against mortality for men, but this pattern is not shared by women. Overall, our findings highlight the important role of emotional well-being, particularly feeling hopeful about the future, in determining the physical health status of the Japanese elderly. Efforts toward maintaining emotional well-being of the elderly population are needed.

Introduction

A large number of the Japanese people suffer from depressive symptoms. The most recent figures, for 2008, show that seventy thousand people were diagnosed with depression (International Classification of Diseases (ICD)-10, F32: depressive episode, and F33: recurrent depressive disorder), and almost 20% of them were hospitalized. The number of patients with depressive symptoms has indeed doubled over the last decade (Ministry of Health, Labour and Welfare of Japan 2008). Moreover, depression is especially prevalent among the elderly population in Japan (Kaji et al. 2010). While depression constitutes a major form of psychological distress (Mirowsky and Ross 1986), it has also been linked to morbidity and mortality. Past research finds that depressive symptoms are predictive of coronary heart disease (Barefoot et al. 2000), stroke (Everson et al. 1998; Ostir et al. 2001), and all-cause mortality (Herrmann et al. 1998). From this standpoint, the Japanese people, particularly older individuals, are faced with elevated risk of not only being psychologically distressed, but also experiencing a number of physical health problems.

While negative psychological factors are a well-known risk factor for physical health, research has increasingly documented the health benefits of the positive aspect of one's psychological status, that is, positive affect. It refers to individuals' positive psychological qualities, such as happiness, personal satisfaction, optimism, and morale (Taylor and Brown 1994). Furthermore, research finds that positive and negative affect exhibit independent relationships, and thus these two measures may reflect different personal characteristics (Diener 2000). For instance, research focusing on older Mexican Americans demonstrates that positive psychological traits measured from the Center for

Epidemiologic studies of Depression Scale (CES-D) are predictive of less functional limitations, better walking performance, and lower overall mortality risk, net of the negative affect scale (Ostir et al. 2000). Moskowitz (2003) also finds that positive affect is associated with lower mortality risk from AIDS among male patients in San Francisco who were HIV+ at baseline, and the effects remain strong, even after controlling for the negative affect factors. These research findings provide evidence to support that positive affect is not simply the lack of depressive symptoms (Diener 1984), indicating the importance of investigating negative and positive affect separately.

Although studies examining the psychological status of the Japanese people abound, to date, little attention has been paid to the association between psychological factors and physical health outcomes. Researchers have examined individuals' psychological status, namely the levels of depressive symptoms, primarily as the outcome variable (e.g., Inaba et al. 2005; Tiedt 2010), and less often looked at it as the determinant of physical health conditions. Moreover, current understanding of the role of positive affect is very limited. Overall, little research in Japan has examined the impact of psychological conditions on physical health and even less research has focused on its positive aspect.

Consequently, as one of many still necessary steps in this direction, in this study, we investigate the relationship between emotional well-being and overall mortality among Japanese elders. We focus on the three positive items from the CES-D, that is, "feeling happy," "enjoying life," and "feeling hopeful about the future," and assess how these positive factors are associated with mortality risk during the four-year follow-up period. This research contributes to the existing literature in several ways. First, our focus

on the emotional well-being of Japanese elders provides a more thorough explanation for the mechanisms of Japanese longevity. While the outstanding health records of the Japanese are well recognized, there is less consensus about the factors responsible for their good health outcomes. Second, we take advantage of a large-scale national survey, the Nihon University Japanese Longitudinal Study of Aging (NUJLSOA). Our findings from a nationally-representative sample provide a more global perspective on the association of emotional well-being with physical health. Third, we pay particular attention to the issue of gender by investigating the model for men and women separately. Since gender is a proxy for the differences in the lives of men and women (Denton and Walters 1999), it is important to examine how the impact of positive affect differs by gender. In what follows, we describe data and measures. In the subsequent section, we present findings and summarize the implications of the study.

Methods

Data

In this research, we draw on three waves of the NUJLSOA to study the relationship between emotional well-being and the risk of mortality among the Japanese elderly. We use the first wave of 1999, and estimate the mortality risk by the third wave of 2003. The first wave consisted of 4,997 observations. We dropped 882 individuals who were not followed-up on by the third wave. The sample size was further reduced due to missing values on key variables. The final sample size was: "happy" (n=3,047, death=375), "enjoy" (n=3,066, death=376), and "hopeful" (n=2,731, death=346).

Measures

The original CES-D has twenty items in four responses of "rarely or none of the time," "some of the time," "much of the time," and "more or all the time." The NUJLSOA uses the shorter version of the CES-D, known as the Iowa Form (Kohout et al. 1993), with eleven items and three response categories: "hardly ever or never," "some of the time," and "much or most of the time." There is an additional item in our data, that is, "I felt hopeful about the future." Overall, we use in total twelve items of the CES-D in this study. Our focal independent variables are the three positive items: "I was happy," "I enjoyed life," and "I felt hopeful about the future." Previous studies have identified these items as positive affect factors (Ostir et al. 2000). We created three dummy variables for happiness, enjoyment, and hope: those who reported "some of the time" or "much or most of the time" for these items were coded 1, and "hardly ever or never" – 0.

The following variables at baseline are included in the analysis: gender (1=male), age (continuous); marital status (1=currently married), educational attainment (1=more than high school education), higher income (1=higher than the 50th percentile), employment status (1=currently working or engaging in household chores), self-reported poor health (1=very poor or poor), functional limitation (1=any difficulty in activities of daily living [ADLs] and instrumental activities of daily living [IADLs]) , and health behaviors (1=current smoker, and 1=current drinker). Due to the higher levels of missing data on income, we include another variable for missing responses of income. In addition, given the potential influences of relational contexts on individuals' psychological conditions, we include the following variables: the number of immediate family (continuous), satisfaction with relationships with children (1=satisfied), and group

membership (1=belong to at least one social group). We also include a nine-item negative

scale from the CES-D: "I felt depressed," "I felt lonely," "I felt sad," "people were

unfriendly," "I felt that people disliked me." "I could not get going," "I lost appetite," and

"I was bothered by things that do not usually bother me." The internal consistency of this

scale is high (alpha= .80).

Logistic regression analysis was performed (1) to determine factors associated

with the three positive items; and (2) to investigate the impact of positive affect on the

risk of mortality. In the mortality analyses, we employed data for the overall population,

men, and women, using two sequential models. We first estimated a reduced form model

to identify the total effect of positive affect on the odds of death net of a negative affect

scale (model 1), and then we estimated an expanded model to determine whether the

effect was reduced after we introduced covariates (model 2). All analyses and estimates

used the NUJLSOA sample weights. Analyses throughout were conducted in Stata10

(StataCorp 2007).

Results

Descriptive statistics in Table 1 summarize the distribution of positive affect

among the Japanese elderly. On the one hand, 48% of the respondents felt happy, and the

proportion for those who enjoyed life reaches 52%. On the other hand, only 30% of the

sample felt hopeful about the future.

Table 2 presents sociodemographic factors predictive of feeling happy, enjoying

life, and feeling hopeful about the future. Several points are worth emphasizing. First,

sociodemographic characteristics related to positive affect differ by types. For instance,

males are less likely to feel happy and enjoy life than their female counterparts, but gender matters less in the hopeful analyses. Age is associated with lower odds of feeling hopeful, but it is not predictive of happiness and enjoyment. Second, higher SES, measured by high school education and higher income, are related to positive affect, except for high school education in terms of a sense of hope. Third, poor reported health is consistently related to lower odds of feeling happy, enjoying life, and feeling hopeful about the future. Finally, relational satisfaction with children is strongly associated with positive psychological conditions.

The results from logistic regression models of all-cause mortality are presented in Tables 3 and 4. We begin by the overall population (Table 3). Model 1 shows the baseline differences in mortality, controlling only for the negative CES-D scale. All the three positive items are inversely associated with the risk of death during the follow-up period. Note in model 2, however, that the addition of sociodemographic characteristics, health status, health behavior, and social relationship variables substantially reduces the protective effect of feeling happy and enjoying life among the Japanese elderly. Net of all controls, the initially significant associations between these two factors and mortality are rendered insignificant. On the other hand, even when all the covariates are included in model 2, the association between feeling hopeful and mortality risk continues to be robust. Those individuals who felt hopeful about their future exhibit 29% lower odds of dying (odds ratio [OR] = .71) compared to those who did not during the follow-up period, net of all controls. The results remain significant at the .05 level.

Models estimated separately for men and women are shown in Table 4. Two important patterns are evident. First, we observe large gender differences in the

association of positive affect with death. While all the positive items are related to lower mortality risk among men (model 1), this pattern is not shared by women, except for being hopeful (OR= .67). Second, feeling hopeful about the future offers protection against death only for men. The inclusion of all the covariates in model 2 wipes out the significant effects of happiness and enjoyment. However, the protective effects of feeling hopeful remain strong among male respondents, net of all controls. Men with a sense of hope for the future are at a significantly reduced risk for mortality compared to those without this psychological quality (OR = .65). The results are significant at the .05 level.

Table 4 also shows significant independent predictors of mortality among Japanese elders. These include older age, physical health problems, and the negative affect scale at baseline. Employment status is inversely associated with the risk of death only among women, while higher income is protective against mortality only among men. Consistent with prior research (e.g., Iwasaki et al. 2002), group membership provides powerful protection against mortality among older people in Japan, suggesting the importance of social integration for elderly well-being.

Discussion

In this paper, we tested the association between emotional well-being, measured by feeling happy, enjoying life, and feeling hopeful about the future, and the risk of mortality over the four-year study period among older individuals in Japan. Four main findings emerge from this study. First, different factors are associated with positive psychological qualities. While those who feel happy and enjoy life share similar sociodemographic characteristics (e.g., gender, high school education, and higher

income), predictors of being hopeful (e.g., age) are considerably different. Second, we find that positive affect is inversely associated with the risk of mortality in the overall population. The models indeed account for the effects of the negative affect scale, and thus these results provide evidence to support a relationship between positive affect and physical health status that is independent of negative affect (Ostir et al. 2000). Third, it is a sense of hope for the future that offers the most powerful protection against mortality risk among older people in Japan. The effects of being hopeful remain strong, even after controlling for relevant sociodemographic, health, behavioral, and relational factors at baseline. On the other hand, the addition of these variables reduces the effects of feeling happy and enjoying life to non-significance. Finally, emotional well-being appears to operate differently for men and women. Men largely benefit from feeling hopeful, whereas positive affect does little in terms of the risk of mortality among women.

Taken as a whole, the present findings suggest that positive affect, in particular feeling hopeful about the future, yields strong health benefits for the Japanese elderly. A sense of hope appears to occupy an important role in determining the physical health status of older persons in Japan, which is quite different from happiness and enjoyment in life. Moreover, feeling hopeful offers strong protection against death for men. This is of particular importance from the public health perspective. Most wage employees in Japan face mandatory retirement at age 60. A large proportion of working men seek second careers until age 65, when they become eligible for full public benefits, and thus men in Japan experience re-retire at a variety of ages (Raymon et al. 2009). Although past research finds that working status is not directly related to the physical health status of the Japanese elderly (Tokuda et al. 2008), ample evidence from Western societies

suggests that individuals experience social withdrawal and lose their social roles after retirement, thereby experiencing psychological distress (Mirowsky and Ross 2003). These observations raise the possibility that older men in Japan might be at greater risk of having mental as well as physical health problems during the postretirement period. Our findings document that feeling hopeful about the future significantly lowers mortality risk for men aged 65 and over. Thus, a sense of hope for the future is a major contributor to the physical well-being of the older male population in Japan. In this study, only 30% of the respondents felt hopeful, while more than half of the sample felt happy and enjoyed life, suggesting that it might be more difficult to feel hopeful about the future at older ages than to have a sense of happiness and enjoyment. Furthermore, given the social circumstances after the Great Eastern Japan Earthquake of March 2011, the challenge emerges as to how to help the elderly stay hopeful about their lives and future in the face of this historic disaster. It is important to rebuild community-based social networks through which older people can receive instrumental, informational, and emotional support (Muramatsu and Akiyama 2011). Efforts toward strengthening social interactions and maintaining the emotional well-being of older persons are needed.

Our study also contributes to the on-going discussion on Japanese longevity. While researchers often look at biological risks (e.g., Crimmins et al. 2008), the present study reveals the role of individuals' psychological characteristics in explaining the physical health status of the Japanese. Our findings underscore the importance of accounting for a wide range of social, cultural, and psychological factors for better understanding the mechanisms of the phenomenal health of the Japanese people.

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Table 1: Descriptive statistics of positive affect, 1999

	Overall	Male	Female
Felt happy (n=3,047)	1,454 (.48)	592 (.20)	862 (.28)
Enjoyed life (n=3,066)	1,573 (.52)	668 (.23)	905 (.29)
Felt hopeful about the future (n=2,731)	803 (.30)	364 (.14)	439 (.16)

Note: Columns contain absolute numbers with proportions in parentheses.

Table2: Odds ratios of reporting positive affect among Japanese elders, 1999

	Happy	Enjoy	Hopeful
Sociodemographic factors:			
Male	.64***	.72**	.89
Age	1.00	.99	.98**
Married	1.07	.87	.88
High school education	1.27**	1.32***	1.14
Currently working	.77**	.77**	.90
Higher income	1.45***	1.60***	1.49***
Income missing	.69**	.64***	.76*
Health status:			
Self-reported poor health	.77**	.75**	.68***
ADLs/IADLs	.93	.75*	.90
Health behavior:			
Current smoker	.88	.91	.85
Current drinker	1.05	1.12	1.30**
Social relationship:			
Number of family	.98	1.01	1.05*
Relationship with children	1.29**	1.52***	1.24*
Group membership	1.12	1.26**	1.03
Number of observation	3,047	3,066	2,731
logL	-2067.09	-2058.30	-1621.73

*** $p<.001$; ** $p<.05$; * $p<.10$

Table 3: Associations between positive affect and all-cause mortality among Japanese elders, overall population, 1999

	(1) Happy (n=3,047)		(2) Enjoy (n=3,066)		(3) Hopeful (n=2,731)	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
Positive affect:						
Happy	.80*	.92	-	-	-	-
Enjoy	-	-	.69**	.83	-	-
Hopeful	-	-	-	-	.60***	.71**
Sociodemographic factors:						
Male		1.77***		1.68**		1.81***
Age		1.10***		1.10***		1.10***
Married		1.05		1.07		1.10
High school education		1.19		1.21		1.23
Currently working		.74*		.70**		.70**
Higher income		.72*		.71*		.71*
Income missing		1.37		1.39		1.48*
Health status:						
Self-reported poor health		1.66***		1.64**		1.66**
ADLs/IADLs		1.83***		1.82***		1.71**
Health behavior:						
Current smoker		1.40*		1.38*		1.33
Current drinker		.62**		.63**		.63**
Social relationship:						
Number of family		1.00		.99		.97
Relationship with children		.94		.96		.99
Group membership		.61***		.62***		.60***
Negative affect	1.11***	1.04*	1.11***	1.05**	1.11***	1.04*
Number of death	375		376		346	
logL	-996.79	-882.36	-996.33	-882.49	-907.35	-801.62

*** p<.001; ** p<.05; * p<.10

Table 4: Associations between positive affect and all-cause mortality among Japanese elders, stratified by gender, 1999

	(1) Men						(2) Women					
	Happy (n=1,333)		Enjoy (n=1,342)		Hopeful (n=1,223)		Happy (n=1,714)		Enjoy (n=1,724)		Hopeful (n=1,508)	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
Positive affect:												
Happy	.68**	.81	-	-	-	-	.92	1.02	-	-	-	-
Enjoy	-	-	.60**	.72	-	-	-	-	.76	.91	-	-
Hopeful	-	-	-	-	.52***	.65**	-	-	-	-	.67*	.74
Sociodemographic factors:												
Age		1.10***		1.10***		1.11***		1.10***		1.10***		1.10***
Married		1.25		1.22		1.39		.92		.94		.86
High school education		1.25		1.30		1.25		1.19		1.19		1.27
Currently working		.82		.78		.80		.69**		.65**		.67**
Higher income		.57**		.53**		.53**		1.06		1.14		1.27
Income missing		1.53		1.68*		1.72*		1.06		.98		1.25
Health status:												
Self-reported poor health		1.85**		1.77**		1.92**		1.46***		1.48*		1.34
ADLs/IADLs		1.99**		1.90**		2.02**		1.72**		1.77**		1.50*
Health behavior:												
Current smoker		1.36		1.33		1.37		1.85*		1.83*		1.53
Current drinker		.61**		.62**		.64**		.69*		.67*		.66
Social relationship:												
Number of family		1.02		1.01		.98		.98		.97		.98
Relationship with children		1.41		1.37		1.26		.71*		.75		.81
Group membership		.52***		.54***		.55**		.68**		.68**		.62**
Negative affect	1.21***	1.14***	1.21***	1.14**	1.20***	1.12**	1.06*	.99	1.06**	.99	1.06*	1.00
Number of death	189		188		181		186		188		165	
logL	-468.98	-407.62	-466.46	-405.91	-441.40	-381.62	-516.58	-462.81	-520.11	-465.74	-454.80	-409.75

*** p<.001; ** p<.05; * p<.10