Archives of Gerontology and Geriatrics 60 (2015) 168–177

Contents lists available at ScienceDirect

Archives of Gerontology and Geriatrics

journal homepage: www.elsevier.com/locate/archger

Trajectory of physical health, cognitive status, and psychological well-being among Chinese elderly

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ARTICLE INFO

Article history:
Received 11 June 2014
Received in revised form 21 August 2014
Accepted 5 September 2014
Available online 16 September 2014

Keywords:
Aging
China
CLHLS
Elderly
Growth-curve analysis
Longitudinal study

ABSTRACT

This study investigates the trajectory of various dimensions of health status among the Chinese elderly in their late years. We used growth-curve analyses on a subsample ($n \approx 2000$) of the elderly from the Chinese Longitudinal Health Longevity Survey (CLHLS) who had longitudinal information from 1998 to 2005. Analyses controlled for a large set of individual and family characteristics. Our findings indicate that elderly who had relatively advantaged childhood socioeconomic status (SES) and who regularly engaged in physical and/or leisure activities had significantly healthier well-being than their respective counterparts on all dimensions considered. In addition, regularly participating in physical and/or leisure activities was associated with slow deterioration of health well-being among the Chinese elderly. The results indicate the potential benefits of engaging in physical and/or leisure activities, and consequently, the importance of implementing programs that promote such activities among elders in China.

1. Introduction

In 2000, close to 90 million adults age 65 and older were living in China, and this number is predicted to increase to over 300 million by 2050, representing 30% of the population. The number of elders age 80 and older is expected to nearly quadruple in China from 12 million in the year 2000 to 40 million by 2030 (Kincannon, He, & West, 2005). As a result of this demographic shift, public and private spending for health care in China has already surpassed the rate of economic growth (Population Reference Bureau, 2006). With the increasing size of the world population over age 65, public health programs and policies must be designed to maintain a healthy aging population.

To understand the well-being of this increasing large population, a fuller picture is warranted. In particular, physical and psychological well-being are interrelated throughout life, and such interrelations may be particularly salient during late life. For example, the strongest predictor of psychological well-being among older adults is physical health and the absence of chronic pain (Fiske, Wetherhill, & Gatz, 2009). Psychological well-being also influences trajectories of physical health status, activities of daily living (ADL), and cognitive function (Blazer, 2003). Depressive symptoms have been shown to slow recovery from hip fractures (Morghen et al., 2011) and to accelerate mild cognitive impairment and dementia (Spira, Rebok, Stone, Kramer, & Yaffe, 2012).

Scholars have begun to examine factors that contribute to healthy longevity among the oldest-old, those 80 years and older, in China over the past decade with the release of the Chinese Longitudinal Health Longevity Survey (CLHLS) (Zeng, Poston, Smith, Vlosky, & Gu, 2008). This strand of literature has focused on identifying the factors that contribute to physical health, longevity, and mortality. For example, Dupre, Liu, and Gu (2008) found that education, economic independence, being married, and regularly consuming vegetables were important for longevity and that physical and cognitive impairments were the most robust factors associated with longevity. Access to health care services has also been associated with healthy longevity among Chinese elderly (Dupre et al., 2008; Gu, Zhang, & Zeng, 2009). Consistent with life course perspectives (Elder, Johnson, & Crosnoe, 2003; Farraro & Shippee, 2009), studies also indicate the importance of childhood socioeconomic conditions and healthy longevity (Yi, Gu, & Land, 2007). In particular, childhood nutritional deprivation was found to be related to the likelihood of developing cognitive impairment during later life (Zhang, Gu, & Hayward, 2010).

Building upon this emerging literature, this study examines the trajectory of diverse dimensions of health status among the

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http://dx.doi.org/10.1016/j.archger.2014.09.001
0167-4943/

Chinese elderly. We start with the premise that a life course perspective is needed to understand current physical and psychological status (Dannefer, 1987; Elder et al., 2003; Farraro & Shippee, 2009; O'Rand, 1996). Chronic diseases and disabilities in late life are influenced by cumulative adversities such as low childhood socioeconomic status (SES), poor nutrition, and lack of access to medical care and education (Ben-Shlomo & Kuh, 2002). Physical health and psychological well-being in late adulthood are also strongly related to SES, lifestyle, social support, and family relationships (Mjelde-Mossey, Chin, Lubben, & Lou, 2009; Yunong, 2011). We thus examine the trajectories of physical health status, ADL functioning, cognitive function, and psychological well-being using CLHLS data through a growth curve analysis. To our knowledge, our study is the first to examine factors that contribute to the health and mental health trajectories over a specific period of time among the CLHLS study participants. Previous studies using this dataset have adopted approaches more in line with a cross-sectional perspective. Our study carries important implications for programs designed to prevent decline and facilitate health-related well-being among the oldest-old in China and among the elderly in other parts of the world, as well.

2. Materials and methods

2.1. Data and study population

We used the CLHLS, a collaborative effort between Duke University in the United States and Peking University in China. With emphasis on the oldest-old aged 80 and older from 22 provinces in mainland China, the CLHLS collected face-to-face interviews with 8959, 11,161, 20,421, 18,524, and 19,863 individuals in 1998, 2000, 2002, 2005, and 2008, respectively, using internationally compatible questionnaires (Zeng et al., 2008). Newly recruited samples were added starting in 2000 to augment the sample sizes. An initial sample of 8959 elderly aged 80 to 105 years was interviewed in 1998; of those, 4831 respondents (53%) were re-interviewed in 2000, 894 (10%) persons were lost to follow-up, and 3368 (37%) died before this second interview. Of the 4831 elderly re-interviewed in 2000, 2643 respondents (55%) were re-interviewed in 2002, 585 (12%) were lost to follow-up, and 1604 (33%) died before this third interview. About one-third of the original sample were lost at each wave due to death before follow-up. Of the 2643 elderly re-interviewed in 2002, 1051 respondents (40%) were re-interviewed in 2005, 284 (11%) were lost to follow-up, and 1308 (49%) died before this fourth interview. A total of 358 of the 1998 initial interviewees were re-interviewed in 2008. Details of the sampling design, response rates, attrition, and systematic assessment of data quality across numerous measures in the survey are described elsewhere (Zeng et al., 2008). To obtain a decent sample size, we used information from 1998 to 2005 for a total analyzed sample of about 2000 elderly participants (depending on the outcome variables).

Of note, the initial sample of 8959 elderly, by design, represents positive selection in health well-being among the Chinese elderly. Over time, an even healthier subset of the initial interviewees comprised the longitudinal data set. Due to this selection issue, we are cautious about extrapolating our results to the general elderly population in China.

2.2. Measures

2.2.1. Health well-being

In this analysis, we examined not only physical health (i.e., chronic disease, ADL disability), but also the elderly participant's psychological and cognitive well-being. In doing so, we hoped to capture a more complete picture of the oldest-old in China.

2.2.2. Psychological well-being

From 1998 to 2005, the CLHLS included seven items designed to tap the participants' psychological state, including items such as "always look on the bright side of things," "often feel fearful or anxious," "often feel lonely and isolated," and "are you as happy as when you were younger," with responses ranging from "always (1)" to "never (5)." We reverse coded negative feelings so that the higher the score, the more positive the psychological well-being. We combined the seven items to create a standardized score with a mean of 0 and a standard deviation of 1 (α ranged from 0.65 to 0.70 across the four waves). It is important to note that our study is limited to self-reported psychological well-being. Although the items included in the CLHLS were not associated with established indices such as the 20-item Life Satisfaction Index or the 20-item Center for Epidemiologic Studies Depression Scale, previous work (Wu & Schimmele, 2006) has shown that items in CLHLS taps into important dimensions of psychological well-being such as optimism, conscientiousness, personal control, happiness, neuroticism, loneliness, and self-esteem. The use of these items as a measure of psychological well-being has also been used in many previous studies using the CLHLS (Chen & Short, 2009; Wu & Schimmele, 2006; Zhang & Liu, 2007).

2.2.3. Presence of chronic disease

The CLHLS asked respondents to indicate if they suffered from any of more than 15 types of chronic disease that are commonly associated with aging. We classified the participant as having a chronic disease (coded as 1, 0 otherwise) if he or she reported suffering from hypertension, diabetes, heart disease, stroke, bronchitis, pulmonary tuberculosis, cancer, a prostate tumor, a gastric or duodenal ulcer, Parkinson's disease, arthritis, or dementia. We excluded diseases such as cataracts and glaucoma because of their prevalence among the elderly population. We also created a continuous variable to count the number of chronic diseases an elderly person had at the time of the survey. The results are similar between the use of the dichotomous variable (i.e., having a chronic disease) and the continuous indicator in terms of the association between independent variables and chronic diseases, we thus presented the results using the dichotomous indicator for brevity. We used modified version of the linear probability model for the dichotomous indicator following previous literature (Landerman, Mustillo, & Land, 2011).

2.2.4. Having ADL disability

The elders were asked whether they could perform the following ADL: bathing, dressing, toileting, indoor transfers, continence, and feeding. The elders were considered ADL disabled if they reported that they could not do one or more of these activities. Similarly, we used the modified version of the linear probability model in estimating the dichotomous outcome (Landerman et al., 2011).

2.2.5. Cognitive impairment

The internationally accepted Mini-Mental State Examination (MMSE) questionnaire (Folstein, Folstein, & McHugh, 1975) was adapted and translated into Chinese and was collected as part of the CLHLS. The MMSE captured five dimensions of the elderly participants' mental ability: orientation (e.g., "what time of day is it right now"), registration (e.g., testing the memory by asking the elder to repeat a sequence of objects provided by the interviewer), attention and calculation (e.g., math), recall (e.g., repeat the words that were repeated a while ago), and language (e.g., repeat the sentence provided by the interviewer). Following prior research (Tombaugh & McIntyre, 1992), we defined respondents who scored under 18 out of a total possible score of 30 as cognitively impaired. We adopted a score of 18 or below based on previous