



Late-career unemployment and all-cause mortality, functional disability and depression among the older adults in Taiwan: A 12-year population-based cohort study



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ABSTRACT

Objective: To evaluate whether late-career unemployment is associated with increased all-cause mortality, functional disability, and depression among older adults in Taiwan.

Method: In this long-term prospective cohort study, data were retrieved from the Taiwan Longitudinal Study on Aging. This study was conducted from 1996 to 2007. The complete data from 716 men and 327 women aged 50–64 years were retrieved. Participants were categorized as normally employed or unemployed depending on their employment status in 1996. The cumulative number of unemployment after age 50 was also calculated. Logistic regression analysis was used to examine the effect of the association between late-career unemployment and cumulative number of late-career unemployment on all-cause mortality, functional disability, and depression in 2007.

Results: The average age of the participants in 1996 was 56.3 years [interquartile range (IQR) = 7.0]. A total of 871 participants were in the normally employed group, and 172 participants were in the unemployed group. After adjustment of gender, age, level of education, income, self-rated health and major comorbidities, late-career unemployment was associated with increased all-cause mortality [Odds ratio (OR) = 2.79; 95% confidence interval (CI) = 1.74–4.47] and functional disability [OR = 2.33; 95% CI = 1.54–3.55]. The cumulative number of late-career unemployment was also associated with increased all-cause mortality [OR = 1.91; 95% CI = 1.35–2.70] and functional disability [OR = 2.35; 95% CI = 1.55–3.55].

Conclusion: Late-career unemployment and cumulative number of late-career unemployment are associated with increased all-cause mortality and functional disability. Older adults should be encouraged to maintain normal employment during the later stage of their career before retirement. Employers should routinely examine the fitness for work of older employees to prevent future unemployment.

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1. Introduction

The aging of the world's population has become a serious challenge to Western and Asian developed countries. According to

the World Health Organization, an aged country is one in which people over 65 years old comprise more than 7% of the total population. According to the Department of Health of Taiwan, the proportion of aged people rose from 8.6% to 10.7% between 2000 and 2010 (Department of Health EY, 2012), and the Council for Economic Planning and Development predicts that it will rise to 22% by 2027 (Council for Economic Planning and Development, 2012) which could be the fastest rate of aging in the world in the

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near future. Because of the rapidly aging population, the annual crude mortality rate of Taiwanese citizens aged 65 years increased from 46.9% to 68.5% in the period from 1981 to 2010 compared with those in other age groups (Department of Health EY, 2011).

Work is essential in daily life and consumes a substantial proportion of people's time. As populations age with improvements in medical science, people currently retire later in life than they did previously (Denton & Spencer, 2009; Zantinge, van den Berg, Smit, & Picavet, 2014). Work is a crucial medium for older adults to connect with society and thus receive access to social support (Fesko, Hall, Quinlan, & Jockell, 2012). Having satisfying work promotes self-esteem and is key for favorable health.

However, world economies started to decrease in 2008, and the unemployment rate increased in numerous developed countries. Previous studies have revealed that involuntary job loss causes the deterioration of both physical and mental health and even increases mortality (Dupre, George, Liu, & Peterson, 2012; Halliday, 2014; Keefe et al., 2002; McKee-Ryan, Song, Wanberg, & Kinicki, 2005) from increased cardiovascular disease (Meneton et al., 2014), increased traffic accidents (Browning & Heinesen, 2012), and increased alcohol abuse (Eliason, 2014). The mortality rate increases as the time spent unemployed increases (Garcy & Vagero, 2012). According to a study conducted during the recession, those who were unemployed had a higher mortality rate, whereas those who were employed had a lower mortality rate (Noelke & Beckfield, 2014).

The effect of unemployment on an individual or family is large for middle-aged and older adults. Several essential factors related to late-career unemployment exist, including low personal and household income, decreased likelihood of having medical insurance (Couch, 1998), decreased probability of obtaining a new job (Chan & Stevens, 2001), and no further accumulation of crucial assets (Bernheim et al., 2000; Helman, Copeland, & VanDerhei, 2010). Gallo, Bradley, Siegel, & Kasl (2000) conducted a series of studies concerning late-career unemployment and found that late-career unemployment was related to disability and depression, especially for those with lower incomes (Gallo, Bradley, & Dubin et al., 2006). Cumulative unemployment during the later career stage can cause more severe symptoms of depression. (Gallo, Bradley, Teng, & Kasl, 2006) Furthermore, late-career unemployment is also related to increased incidence of cardiovascular disease and stroke (Gallo, and Teng et al., 2006).

Previous studies have focused on the relationship between unemployment and mortality, but very few studies have discussed it among Asian populations. Only a few studies have addressed the impact of unemployment on disability. Hirokawa, Tsutusmi, & Kayaba (2006) found a 51% increase in mortality for Japanese men who lost their jobs compared with the employed population. In Taiwan, Tsai, Lan, Lee, Huang, & Chou (2004) found a 99% increase in mortality for the unemployed population, but this study was conducted over only 2 years. No study has discussed the relationship between unemployment and functional disability in Asian older adults. The aim of the current study was to explore the relationship between late-career unemployment and cumulative unemployment after age 50 and future mortality, functional disability, and depression by using a national population cohort study.

2. Methods

2.1. Data sources

We retrieved data from the Taiwan Longitudinal Study in Aging (TLISA), a population-based, national representative study initiated by the Bureau of Health Promotion of Taiwan, and the Population Studies Center and the Institute of Gerontology at the University of

Michigan in the United States. Data were collected from systematically selected representative samples of the Taiwanese population, including institutionalized elderly people. Personal interviews were conducted by a highly trained interviewer. To maintain high data quality, careful supervision was provided during data collection, and data processing was conducted by a professional data entry company.

TLISA was started in 1989 for the first wave of the study. By 2007, it had completed 6 waves of this study. For this research, we used the supplement sample of 1996, which included 2462 subjects who were 50–66 years old in 1996. We followed them for 12 years and used data from 2007 to analyze outcomes. The Population Studies Center at the University of Michigan reviewed the representativeness of the completed sample in the 1989 survey. The results showed that the sample was highly representative, with a 91.8% response rate. With high response rates for both survey cohorts in the 1996 survey (89% for the first cohort and 82% for the supplemental sample), both survey cohorts retained their high sample representativeness. Details of the study design have been described elsewhere (Liang et al., 2010; Martin, Zimmer, & Hurng, 2011; Pu, Tang, Huang, & Chou, 2011).

The mortality rate was verified in 2007 by using the Death Registration from the Ministry of the Interior in Taiwan. Survival was estimated for the years 1996 through 2007.

2.2. Study group identification

Our inclusion criterion was an age of 50–64 years old in 1996. People who were not at risk of unemployment in 1996 (being housewives, assisting with a family business, or being unemployed due to retirement), had a functional disability in 1996, or had depression in 1996 were excluded from this study. Thus, 1043 subjects were included in the final analysis.

2.3. Research variables

We gathered subject data from the year 1996 regarding age (separated into 50–54, 55–59, and 60–64 cohorts), gender, level of education, marital status, income level, self-rated health, presence or absence of six major diseases (cancer, hypertension, diabetes, stroke, cardiovascular disease, arthritis), Center for Epidemiological Studies Depression Scale (CES-D), and activity of daily living (ADL). Levels of education were divided into four groups: illiterate (0 years), elementary school (1–6 years), junior to senior high school (7–12 years), and college or above (>12 years). Income level was determined by asking participants how they felt about their income level. Possible answers were *very satisfied*, *satisfied*, *fair*, *unsatisfied*, and *very unsatisfied*. We classified income level as “good and fair” (rated as *very satisfied*, *satisfied*, or *fair*) and “poor” (rated as *unsatisfied* or *very unsatisfied*). The 10-item CES-D measures depressive symptoms. On this scale, the scores ranged from 0 to 30, and the cut-off point for depression was a score of 10 or higher. Self-rated health was determined by asking participants how they rated their current health. Possible answers were *excellent*, *good*, *fair*, *poor*, and *very poor*. We classified people into three groups: good (rated as *excellent* or *good*), fair (rated as *fair*), and poor (rated as *poor* or *very poor*). Functional status is the ability to perform ADL such as bathing, dressing, eating, getting out of bed, walking, and using the bathroom (Katz, Ford, Moskowitz, Jackson, & Jaffe, 1963). We regrouped participants into two groups: none and at least one ADL disability.

For employment status in 1996, we divided our subjects into two groups: normally employed and unemployed. We also calculated the cumulative numbers of unemployment since 50 years of age for each subject. In 2007, we collected data regarding mortality, CES-D, and ADL for outcome measurement.

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