

- [Previous Article](#)
- [Next Article](#)

ORIGINAL ARTICLES

Correlations of Self-rated Health and Healthcare Utilization among Widowed Older Adults with Chronic Disease, and Taiwan

HO, Shu-Hsi

[Author Information](#)

PhD, Associate Professor

Accepted for publication

*Address correspondence to: +886-4-23892088 ext.

The author declares no

Cite this article as: Ho, S.

utilization in widowed older adults with chronic disease, and Taiwan

<https://doi.org/10.1097/jnr.000000000000248>

Journal of Nursing Research [26\(5\):p 308-315, October 2018.](#) | DOI: 10.1097/jnr.000000000000248

- Free

Abstract

Background:

Taiwan has a rapidly aging population. It is well known that older adults usually have worse health than younger adults, with widowed older adults at a particularly high risk of poor health. Widowed older adults experience the effects of bereavement, which affects their health. Therefore, health topics related to widowed older adults deserve special attention.

Purpose:

The aim of this study was to discuss self-rated health for chronic diseases and healthcare utilization among widowed older adults.

Methods:

A cross-section of data was used to analyze self-rated health-related issues. Data were adopted from the National Health Interview Survey in Taiwan, with the data on adults aged 65 years and over extracted and included in the assessment. Multinomial logistic regression models were used to investigate the relationships between healthcare utilization and self-rated health and chronic disease variables.

Results:

The main empirical results show worse self-rated health status among widowed older adults in comparison with their nonwidowed peers and worse health status for widowers than widows. Next, age was negatively correlated with health rating, whereas a positive correlation with health was found for education. In addition, chronic diseases, particularly stroke, were found to be a significant predictive factor related to poor health

Your Privacy

To give you the best possible experience we use cookies and similar technologies. We use data collected through these technologies for various purposes, including to enhance website functionality, remember your preferences, show the most relevant content, and show the most useful ads. You can select your preferences by clicking the link. For more information about cookies, please review our [Privacy & Cookie Notice](#)

Reject All Cookies

Accept All Cookies

[Manage Cookie Preferences](#)

sease, and Taiwan

Taiwan, ROC.

Taiwan, ROC. Tel:

e, and healthcare
08-315.

status. Similar results were observed for healthcare utilization, apart from traditional Chinese medicine. Older adults who habitually purchased and used traditional Chinese medicine were shown to enjoy relatively better health statuses.

Conclusions/Implications for Practice:

These findings identify health for widowed older Health Insurance System responsible for develop

Introduction

Taiwan is a rapidly aging increase to 20% of the t increasing in Taiwan. N General of Budget, Accounti expectancy was 79.8 in older adults are not hea

Older adults, particular alive. Widowed older ac health and survival rate Liu, & Subramanian, 2013, &

homogenous group, although some variability has been shown based on socioeconomic status. Studies on whether being widowed affected adults in their later lives have produced mixed results. Moreover, studies have obtained few definitive results regarding the relationship between a widowed adult and health status. Some studies empirically examined the marriage protection hypothesis, which posits that widowed people are less likely to show good health and face a higher risk of death (Espinosa & Evans, 2008; Moon et al., 2013). Nevertheless, Bennett, Chen, Soroui, and White (2009) showed that health status depends on health literacy. In addition, Sarah and Richard (2014) found gender differences in health status change tendencies. These disparate results indicate that further studies are needed to clarify the age-related health issues faced by widowed persons.

In assessing the health of older adults, an abundance of studies (Bennett et al., 2009; Campos et al., 2015; French et al., 2012; Ho, Li, & Liu, 2009; Li, Chi, Krochalk, & Xu, 2011; Moriconi & Nadeau, 2015) have used self-rated health (SRH) as a screening tool. However, Clarke and Ryan (2006) and Crossley and Kennedy (2002) questioned the reliability of SRH. Thus, SF-36 (short form-36) and SF-12 have been applied in several research studies (Ngo-Metzger, Sorkin, Mangione, Grandek, & Hays, 2008; Wee, Davis, & Hamel, 2008; Younsi, 2015). Nevertheless, Chamberlain et al. (2014) and Wolinsky et al. (2008) found no significant difference between the results obtained by SRH and other measures. Moreover, SRH utilizes a single-item health measurement. In addition, the World Health Organization also recommended this indicator to verify health in population-based studies. Therefore, the present article uses SRH as a dependent variable in an investigation of health-related issues.

The SRH has been widely discussed to explain social demographic factors (Campos et al., 2015; French et al., 2012; Ho et al., 2009; Li et al., 2011), chronic diseases (Ho et al., 2009; Wolinsky et al., 2008; Wu et al., 2013), and healthcare utilization in health (Chamberlain et al. 2014; Ho, 2016; Ho & Hung, 2013; Ho et al., 2009). In addition, some articles have indicated that chronic disease has a negative effect on SRH. Similar results were found for older adults who had healthcare utilization experience. Most of these older adults reported poorer health than those without healthcare utilization. However, the level of SRH, as rated by healthcare utilization, varied based on disease type and severity. Of these diseases, widowed older adults who had experienced stroke usually showed worse health and were more likely to die than those with other chronic diseases (Ho et al., 2009; Larsen, Biering, Johnsen, Andersen, & Hjollund, 2016). In addition, Campos et al. (2015), French et al. (2012), and Sarah and Richard (2014) found gender differences in predictors of SRH among older adults in Brazil, Chile, and the United States, respectively. Li et al. (2011) further suggested that, for widowed older adults living with family and children in

Your Privacy

To give you the best possible experience we use cookies and similar technologies. We use data collected through these technologies for various purposes, including to enhance website functionality, remember your preferences, show the most relevant content, and show the most useful ads. You can select your preferences by clicking the link. For more information about cookies, please review our [Privacy & Cookie Notice](#)

Reject All Cookies

Accept All Cookies

[Manage Cookie Preferences](#)

gly with self-rated health by the National officials who are ed in Taiwan.

ver is projected to has also been t from The Directorate average life icates that many

ose spouses are still impact on their Moon, Glymour, Vable, led as one

China, filial piety may have a buffering effect on bereavement. Thus, the traditional East Asian cultural encouragement of children and relatives living together may promote the enjoyment of later years of life (Ho & Hung, 2013).

As mentioned, previous studies have discussed SRH issues primarily in terms of a single facet such as demographic factors, chronic diseases, or healthcare utilization and that have seldom been investigated across these factors, particularly in Taiwan. To fill this gap, this study aimed to examine SRH in Taiwan.

Methods

Design

The data used in this research was derived from the NHIS adopted a multistage probability sampling design. The NHIS adopted a multistage probability sampling design. The first stage was to select sampling regions, *lins*, which were selected randomly from the country by trained interviewers.

Sample

The original NHIS sample included 25,632 participants completed the survey. The response rate was 84.0%. For the purposes of the current study, qualified participants were restricted to those aged 65 years or over. Consequently, the data on 2,904 participants were reviewed for this study. Omitting the subjects who reported having never been married or having been divorced or separated left 1,801 sets of data for married older adults with a currently living spouse and 998 sets of data for widowed older adults available for analysis. This study included the data of 2,799 participants and analyzed their SRH status.

Measures

Dependent variables

The health status of the subject was self-rated, with possible responses including “excellent,” “good,” “average,” “not so good,” and “poor.” For the purpose of this study, health responses were combined into a multinomial form—“healthy,” “average,” and “unhealthy”—which has been reported elsewhere (Wu et al., 2013). “Healthy” was defined to include reported health statuses of “excellent” and “good,” “average” correlated with the “average” health status, and “unhealthy” includes reported health statuses of “not so good” and “poor.” The relative risk ratios (RRRs) for healthy and unhealthy peers were calculated based on the average peers, using multinomial logistic regression and controlling for sociodemographic factors, chronic diseases, and healthcare utilization status.

Independent variables

The purpose of this study was to test the relationships between SRH status and chronic diseases and healthcare utilization status among widowed older adults. Thus, variables included widowed people, chronic diseases, and healthcare utilization. First, the marital types as defined in the NHIS were divided into six groups: never married; married, with spouse currently alive; separated; divorced; married, with spouse deceased; and “other.” On the basis of the stated study purpose, the fifth group was used to assess the health status of older widowed individuals.

To examine SRH among widowed older adults, the methods of previous studies were followed (Ho et al., 2009; Schnittker & Bacak, 2014; Wolinsky et al., 2008) and chronic diseases and healthcare utilization were discussed. First, in terms of chronic diseases, older adults were asked to report whether they had been diagnosed with

Your Privacy

To give you the best possible experience we use cookies and similar technologies. We use data collected through these technologies for various purposes, including to enhance website functionality, remember your preferences, show the most relevant content, and show the most useful ads. You can select your preferences by clicking the link. For more information about cookies, please review our [Privacy & Cookie Notice](#)

Reject All Cookies

Accept All Cookies

[Manage Cookie Preferences](#)

chronic diseases such as hypertension, diabetes, heart disease, cholesterol, stroke, asthma, kidney disease, osteoporosis, or arthritis. On the basis of the research of Shah et al. (2012), this study hypothesized that widowed older adults with chronic diseases might show higher RRRs for unhealthy status and lower RRRs for healthy status than those without chronic diseases.

In terms of healthcare utilization, in line with the findings of previous studies (Ho, 2016; Shah et al., 2012; Weiss et al., 2011), Western medicine was considered as healthcare utilization. In line with prior research, it was hypothesized that older adults who took Western medical treatment, inpatient or outpatient, might have used more healthcare resources than those who did not. In line with prior research, it was hypothesized that older adults who received emergency department services might have used more healthcare resources than those who did not.

Control variables

To control the variables of chronic diseases, and healthcare utilization (Shah et al., 2012; Li et al., 2011) and cognitive function (Shah et al., 2012), educational level (less or more than high school), living arrangement (living alone or with others), living with spouse (yes or no), and marital status (widowed or married), on the basis of the findings of previous studies, it was hypothesized that older adults who lived alone with

Ethics

The National Health Research Institutes approved the use of NHIS data for analysis. Furthermore, this study was approved by the research ethics committee (NCUERE SOP/05/01.5) of National Changhua University of Education, Changhua, Taiwan.

Modeling Self-Rated Health

This study used chi-square to test the difference in SRH status between older adults with a spouse and those without. Next, multinomial logistic regression models were used simultaneously to examine SRH status among widowed older adults. Following the methods of Greene (2012), the general equation used for the conditional probability model is

where j is the $j + 1$ possible choices, y_i denotes the dependent variable of SRH, y_0 is average groups, y_1 is healthy groups, and y_2 is unhealthy groups. x_i is the vector of the independent variables, including sociodemographic factors, chronic diseases, and healthcare utilization. β_i is the corresponding coefficient vector.

In addition, this study compared the SRH between widowers and widows, with the estimation function formulated as

where p_j is the probability of SRH j (SRH of a widower) and p_0 is the probability of the reference (the SRH of a widow).

Results

Table 1 shows the data for the 1,801 married older adults whose spouses were still alive and the 998 widowed older adults. Of these, more than 30% ($n = 358$, 35.9%) of widowed older adults rated their current health as unhealthy, whereas 23.7% ($n = 236$) felt that they had worse health status than before. A similar proportion

Your Privacy

To give you the best possible experience we use cookies and similar technologies. We use data collected through these technologies for various purposes, including to enhance website functionality, remember your preferences, show the most relevant content, and show the most useful ads. You can select your preferences by clicking the link. For more information about cookies, please review our [Privacy & Cookie Notice](#)

Reject All Cookies

Accept All Cookies

[Manage Cookie Preferences](#)

dentistry were of 1 if the participant received emergency department services and 0 if the participant did not receive emergency department services.

s, widows, chronic diseases, and healthcare utilization (Shah et al., 2015; French et al., 2015). Older adults younger than 75 years), living arrangements (living alone or with others), and marital status (widowed or married). On the basis of the findings of previous studies (Shah et al., 2012), it was hypothesized that older adults who lived alone with

(24.1%) was found to be in relatively worse health than others. As expected, all of these proportions are larger than older adults whose spouses were still alive. The chi-square test was used to examine the SRH difference between widowed and nonwidowed older adults. As shown in [Table 1](#), empirical results showed a statistically significant difference between these two groups in terms of current SRH, SRH compared before, and SRH compared with others.



TABLE 1:
Self-Rated Health

This study also tested the healthcare utilization. [Table 2](#). In terms of age relatively poor economic average peers. The RRR education, lived alone, and higher among the unhealthy [1.77, 2.54]). In addition healthy and unhealthy ($p = 0.254.81$) and p value illustrating



TABLE 2:
Sociodemographic

[Table 3](#) shows the prevalence of hypertension, diabetes, heart disease, cholesterol, stroke, asthma, kidney disease, osteoporosis, and arthritis. Multinomial logistic regression results found that significant increases in the prevalence of all diseases were associated with the unhealthy groups, with the log likelihood (-2980.810 , $\chi^2(18) = 384.61$) and p value showing significance ($p < .001$) in this model. The RRRs were greater than 1 in the unhealthy groups when compared with the average groups, apart from high blood cholesterol (RRR = 0.80, 95% CI [0.65, 0.98]). Notably, the largest RRRs were for stroke, which had an RRR of 3.56 (95% CI [2.58, 4.90]).



TABLE 3:
Disease Prevalence Among Elderly Widowed Participants, by Self-Rated Health

In contrast, the empirical results indicated that a significantly lower prevalence of all chronic diseases was associated with the healthy groups, which had RRRs between 0.50 and 0.75. Among these, diabetes and stroke only showed half of RRRs (0.50, 95% CI [0.39, 0.65], and 0.50, 95% CI [0.31, 0.80], respectively).

Healthcare utilization by SRH status is shown in [Table 4](#), indicating significantly higher RRRs for emergency treatment (2.85, 95% CI [2.28, 3.54]) and inpatient care (2.71, 95% CI [2.15, 3.42]) in unhealthy groups than in the average groups. However, a lower RRR for Chinese medicine (0.60, 95% CI [0.42, 0.86]) was found in the same comparison groups. In addition, all of these healthcare utilizations were significantly less than one in the healthy groups when compared with the average groups, but dentistry did not show significance. The log likelihood (-3015.844 , $\chi^2(10) = 314.54$) and p value illustrated significance ($p < .001$) when multinomial logistic regression analysis was used.



TABLE 4:
Healthcare Utilization of Elderly Widowed Participants, by Self-Rated Health

To compare the different RRRs of SRH between widowers and widows, as classified by sociodemographic factors, healthcare utilization, and chronic diseases, this study used four different models to describe the relative risk of widowhood for older adults. Model 1 controlled for widowed groups only. Models 2 and 3 described the impact of sociodemographic factors and healthcare utilization on relative risk of SRH. Model 4 considered the combined impact of socioeconomic factors, healthcare utilization, and chronic diseases on relative risk of SRH. The final test results are listed in [Table 5](#).

Your Privacy

To give you the best possible experience we use cookies and similar technologies. We use data collected through these technologies for various purposes, including to enhance website functionality, remember your preferences, show the most relevant content, and show the most useful ads. You can select your preferences by clicking the link. For more information about cookies, please review our [Privacy & Cookie Notice](#)

Reject All Cookies

Accept All Cookies

[Manage Cookie Preferences](#)

nic disease, and risks are shown in current life status, and 7 peers than the primary school us were significantly RRs (2.12, 95% CI icant effects on 5.710, $\chi^2(12) =$ on analysis was used.

SRH, including

For the widowhood group, the RRRs for widowers were found to be significantly less than 1 in the healthy group when compared with the average group among the former three models. Nevertheless, the RRRs lost significance in Model 4, that chronic diseases are most important for utilization variables.

Discussion

This study focused on disability utilization status, and educational level, living status. The RRRs of unhealthy results were found for h Moon et al., 2013, Wu et al., status.

Notably, most widowed for widowers) of the su proportion was slightly 26.4% (28.7% for widow similar to the 24.1% tha appears to be similar be

Taiwan share similar values and ethnic, cultural, moral, and linguistic backgrounds.

Significantly older age (over 75 years) was associated with significantly higher unhealthy status (RRR = 2.12). This phenomenon reflects that the health status of older adults decreases significantly with age. Similar results have been found in most previous studies (Bennett, Ehrenfeld, Markham, & Eagle, 2014, Ho, 2016, Li et al., 2011, Wu et al., 2013). Nevertheless, for the “healthy” groups, age lost significance. This finding differed from the results of Wu et al. (2013) and Ho (2016). Moreover, there was a significant education gradient in SRH. The RRR for unhealthy status in the below primary school education group was significantly higher (1.60) than that in subjects with more than a primary school education. One reason for this may be that subjects with less education were more likely to be in lower income categories (Li, Chen, & Kuo, 2005), facing more difficulties covering living and household expenditures and less likely to be satisfied with their current lifestyle (Dinh, Hébert, Mill, Prentice, & Ward, 2012). Thus, widowed older adults who had less education were less likely to report healthy status. Moreover, regarding living arrangements, this study found that older adults who lived alone had a higher RRR in the unhealthy groups and a lower RRR in the healthy groups in comparison with their average group peers. This finding supports the findings of previous studies (Ho, 2008, Li et al., 2011), which indicate that older adults who live alone show weak social function and networks and are thus at a higher risk of showing poor health. In general, older adults living alone, particularly those who are widowed, typically lack assistance and care from family and thus face a higher relative health risk ratio. This result is consistent with traditional Asian cultural mores that encourage two or three generations to live together and take care of each other (Ho, 2008). In fact, children are more important social and emotional sources. Family function has always been the primary societal institution for providing social support, particularly for widowed older adults (Ho, 2008; Li et al., 2011).

The empirical results indicate that chronic diseases are an important health indicator, as reflected in the poor SRH for older widows. Of the chronic diseases considered, this study further found that the largest RRR was present for stroke in the unhealthy groups and that the smallest RRR was found in the healthy groups when compared with the average groups. This finding supports the opinions of Ho et al. (2009) and Larsen et al. (2016) that individual reports of stroke were generally more strongly associated with SRH than with other related chronic diseases. The individuals with stroke experience were less likely to perform activities of daily living and more likely to rely on others for care, with increased spiritual burdens and financial expenditure for themselves and their families. Thus, individuals with stroke usually reported worse health status than those

Your Privacy

To give you the best possible experience we use cookies and similar technologies. We use data collected through these technologies for various purposes, including to enhance website functionality, remember your preferences, show the most relevant content, and show the most useful ads. You can select your preferences by clicking the link. For more information about cookies, please review our [Privacy & Cookie Notice](#)

Reject All Cookies

Accept All Cookies

[Manage Cookie Preferences](#)

factors, healthcare dicates that age, SRH significantly. ic diseases. Similar research (Ho, 2016; ess their health

widows and 25.62% s unhealthy leanwhile, only “good,” a proportion ivement on health hat China and

without. In addition, hypertension, diabetes, heart disease, cholesterol, kidney disease, osteoporosis, and arthritis also showed significant associations with unhealthy and healthy statuses. These findings were consistent with most previous studies (Ho & Hung, 2013; Ho et al., 2009; Molarius & Janson, 2002; Wu et al., 2013) and were further strengthened by the evidence that chronic diseases are strongly associated with health status, even in widowed older adults.

The relationship between were found for emergency average groups. It is wide stays and emergency treatment. Therefore, widowed old future, which is reflected worthy of attention is that compared with the average jue ming zi, and mai me and use traditional Chinese that prevention is better purchased and used traditional who did not (Molarius & Stuart, Husain, Fahrenbruch healthcare has the potential

Despite what were men the healthy groups, indicating many older men rely heavily medication, visiting doctors, and exercising regularly (Kendall, Wedell, Favreault, & Waldron, 2011). Under this situation, older men typically suffer more from the loss of a partner than older women. In general, women have broader social networks than men, which may help alleviate the physical and mental stresses after the death of a spouse (Espinosa & Evans, 2008). Andrew, Tiedt, and Eileen (2016) also indicated that the influence of widowhood on negative emotions was larger for husbands than for wives. Therefore, widowers usually make certain adjustments (e.g., repartnering) to resolve the stress that follows spousal death (Wu, Schimmele, & Ouellet, 2014).

Conclusions and Limitations

This analysis of the health of widowed older adults provides evidence of a significant association between SRH and chronic diseases and healthcare utilization. We found a worse health status among widowed older adults compared with nonwidowed groups as well as a worse health status for widowers than widows. This facilitated the finding of a better health status among widows than widowers. Age was negatively correlated with health rating, whereas a positive correlation with health was found for education. Chronic diseases, particularly stroke, were found to be a significant predictive factor related to unhealthy status. Similar results were observed for healthcare utilization, apart from traditional Chinese medicine.

On the basis of the results of this study, the social health insurance system should pay more attention to widowed older adults, especially older widowers. The first priority for an improved welfare program for the target group should be improving healthcare services. Convenient and accessible healthcare services help increase healthcare utilization and relieve the symptoms of chronic diseases. Therefore, the national health insurance system should support the provision of adequate healthcare services for widowed older adults. Finally, the conclusions of this study may be used as a screening tool for older adults by the national health insurance system in Taiwan and may be referenced by public health officials in developing welfare strategies for the target group.

The current study is affected by a number of limitations. First, the secondary data that were used did not address factors that have been associated with SRH such as social networks, psychological measurement, and laboratory parameters. A second limitation concerns the use of quantitative analysis. Qualitative in-depth interviews with widowed older adults could provide useful insights into their health status. This is an important direction for future research. Finally, one of the obvious limitations of our demonstrated link between SRH and chronic diseases and healthcare utilization is that the study is limited to the country of

Your Privacy

To give you the best possible experience we use cookies and similar technologies. We use data collected through these technologies for various purposes, including to enhance website functionality, remember your preferences, show the most relevant content, and show the most useful ads. You can select your preferences by clicking the link. For more information about cookies, please review our [Privacy & Cookie Notice](#)

Reject All Cookies

Accept All Cookies

[Manage Cookie Preferences](#)

ably, larger RRRs compared with the including hospital (Ho, 2008). r concern about their groups. Another area y groups when e (e.g., Huang Lian, se people purchase derstanding of health lts who habitually ival rate than those . (2014). Kudenchuk, ges that outpatient / risk.

erved for widowers in dows. In general, ninding to take

Taiwan. To show that this link is typical rather than special will require replicating the results in other countries. The extension of the findings to other countries is a matter for future research.

Acknowledgments

Many thanks to the National Natural Science Foundation of China for the grant from the Ministry of Science and Technology.

References

Andrew D., Tiedt Y. S., et al. (2015). Support from adult children and self-rated health in old age. *Journal of Health Economics*, 50(1), 1–15. <https://doi.org/10.1177/0167629614564444>

- [Cited Here](#) |
- [Google Scholar](#)

Bennett J. M., Chen J., et al. (2013). Self-rated health status and mortality in old age. *Journal of Health Economics*, 38(6), 619–642. <https://doi.org/10.1016/j.jhealeco.2013.05.002>

- [Cited Here](#) |
- [Google Scholar](#)

Bennett J. M., Ehrenfeld S., et al. (2013). Self-rated health and outcomes for patients with pulmonary hypertension and intracardiac shunts and Eisenmenger syndrome: A review of institutional experience. *Journal of Clinical Anesthesia*, 26(4), 286–293. <https://doi.org/10.1016/j.jclinane.2013.11.022>

- [Cited Here](#) |
- [Google Scholar](#)

Campos A. C. V., Albala C., Lera L., Sánchez H., Vargas A. M. D., Ferreira E. (2015). Gender differences in predictors of self-rated health among older adults in Brazil and Chile. *BMC Public Health*, 15, Article 365. <https://doi.org/10.1186/s12889-015-1666-9>

- [Cited Here](#) |
- [Google Scholar](#)

Chamberlain A. M., Manemann S. M., Dunlay S. M., Spertus J. A., Moser D. K., Berardi C., Roger V. L. (2014). Self-rated health predicts healthcare utilization in heart failure. *Journal of the American Heart Association*, 3(3), e000931. <https://doi.org/10.1161/JAHA.114.000931>

- [Cited Here](#) |
- [Google Scholar](#)

Clarke P. M., Ryan C. (2006). Self-reported health: Reliability and consequences for health inequality measurement. *Health Economics*, 15(6), 645–652.

- [Cited Here](#) |
- [Google Scholar](#)

Crossley T. F., Kennedy S. (2002). The reliability of self-assessed health status. *Journal of Health Economics*, 21(4), 643–658. [https://doi.org/10.1016/S0167-6296\(02\)00007-3](https://doi.org/10.1016/S0167-6296(02)00007-3)

- [Cited Here](#) |
- [Google Scholar](#)

Dinh T., Hébert C., Mill K., Prentice M., Ward N. (2012). *The economic impact of improvements in primary healthcare performance*. Ottawa, Canada: Canadian Health Services Research Foundation.

Your Privacy

To give you the best possible experience we use cookies and similar technologies. We use data collected through these technologies for various purposes, including to enhance website functionality, remember your preferences, show the most relevant content, and show the most useful ads. You can select your preferences by clicking the link. For more information about cookies, please review our [Privacy & Cookie Notice](#)

Reject All Cookies

Accept All Cookies

[Manage Cookie Preferences](#)

the grant from the Ministry of Science and Technology.

Journal of Health Economics, 50(1), 1–15. <https://doi.org/10.1177/0167629614564444>

Journal of Health Economics, 38(6), 619–642. <https://doi.org/10.1016/j.jhealeco.2013.05.002>

Journal of Clinical Anesthesia, 26(4), 286–293. <https://doi.org/10.1016/j.jclinane.2013.11.022>

BMC Public Health, 15, Article 365. <https://doi.org/10.1186/s12889-015-1666-9>

Journal of the American Heart Association, 3(3), e000931. <https://doi.org/10.1161/JAHA.114.000931>

Health Economics, 15(6), 645–652.

Journal of Health Economics, 21(4), 643–658. [https://doi.org/10.1016/S0167-6296\(02\)00007-3](https://doi.org/10.1016/S0167-6296(02)00007-3)

The economic impact of improvements in primary healthcare performance. Ottawa, Canada: Canadian Health Services Research Foundation.

- [Cited Here](#)

Espinosa J., Evans W. N. (2008). Heightened mortality after the death of a spouse: Marriage protection or marriage selection? *Journal of Health Economics*, 27(5), 1326–1342.

<https://doi.org/10.1016/j.jhealeco.2008.04.001>

- [Cited Here](#) |
- [Google Scholar](#)

French D. J., Browning
measure with complex
women from three cont

- [Cited Here](#) |
- [Google Scholar](#)

Greene W. H. (2012). *E*

- [Cited Here](#)

Ho S. H. (2008). Surviv
mortality among the mi

<https://doi.org/10.1097>

- [Cited Here](#) |
- [Google Scholar](#)

Ho S. H. (2016). A study of outpatient utilization between widowers and widows among older adults in Taiwan. *Review of Economics and Finance*, 6(1), 79–90.

- [Cited Here](#) |
- [Google Scholar](#)

Ho S. H., Hung W. S. (2013). The impacts of widowhood, chronic disease, and physical function on mortality among older people. *The Journal of Nursing Research*, 21(2), 110–119.

<https://doi.org/10.1097/01.JNR.ob013e3182921ff6>

- [Cited Here](#) |
- [Google Scholar](#)

Ho S. H., Li C. S., Liu C. C. (2009). The influence of chronic disease, physical function, and lifestyle on health transition among the middle-aged and older persons in Taiwan. *The Journal of Nursing Research*, 17(2), 136–143. <https://doi.org/10.1097/JNR.ob013e3181a53f94>

- [Cited Here](#) |
- [Google Scholar](#)

Kudenchuk P. J., Stuart R., Husain S., Fahrenbruch C., Eisenberg M. (2015). Treatment and outcome of out-of-hospital cardiac arrest in outpatient health care facilities. *Resuscitation*, 97, 97–102.

<https://doi.org/10.1016/j.resuscitation.2015.08.025>

- [Cited Here](#) |
- [Google Scholar](#)

Larsen L. O., Biering K., Johnsen S. P., Andersen G., Hjollund N. H. (2016). Self-rated health and return to work after first-time stroke. *Journal of Rehabilitation Medicine*, 48(4), 339–345.

<https://doi.org/10.2340/16501977-2061>

- [Cited Here](#) |
- [Google Scholar](#)

Your Privacy

To give you the best possible experience we use cookies and similar technologies. We use data collected through these technologies for various purposes, including to enhance website functionality, remember your preferences, show the most relevant content, and show the most useful ads. You can select your preferences by clicking the link. For more information about cookies, please review our [Privacy & Cookie Notice](#)

Reject All Cookies

Accept All Cookies

[Manage Cookie Preferences](#)

2012). A simple
n older men and
[36/1471-2458-12-649](https://doi.org/10.1097/01.JNR.ob013e3182921ff6)

national.

rms of total
h,16(2), 160–168.

Li I. C., Chen Y. C., Kuo H. T. (2005). The health status and health promotion behavior of low-income elderly in the Taipei area. *The Journal of Nursing Research*, 13(4), 305–312.

<https://doi.org/10.1097/01.JNR.0000387553.96199.42>

- [Cited Here](#) |
- [Google Scholar](#)

Li Y., Chi I., Krochalk P. (2011). Health status among older adults in China. *International Journal of Nursing Research*, 2397.2011.00818.x

- [Cited Here](#) |
- [Google Scholar](#)

Molarius A., Janson S. (2001). Health status among middle-aged and elderly men and women. *Journal of Aging and Health*, 4356(01)00491-7

- [Cited Here](#) |
- [Google Scholar](#)

Moon J. R., Glymour M. (2009). Long-term associations between weight and health. *Journal of Public Health*, 36(3), 382–389

- [Cited Here](#) |
- [Google Scholar](#)

Moriconi P. A., Nadeau L. (2015). A cross-sectional study of self-rated health among older adults: Association with drinking profiles and other determinants of health. *Current Gerontology and Geriatrics Research*, 2015, Article 352947. <https://doi.org/10.1155/2015/352947>

- [Cited Here](#) |
- [Google Scholar](#)

National Development Council. (2016). *Population projections for R.O.C. (Taiwan): 2016~2060*. Retrieved from <http://www.ndc.gov.tw/en/cp.aspx?n=2E5DCBo4C64512CCands=002ABFoE676F4DB5>

- [Cited Here](#) |
- [Google Scholar](#)

Ngo-Metzger Q., Sorkin D. H., Mangione C. M., Grandek B., Hays R. D. (2008). Evaluating the SF-36 health survey (version 2) in older Vietnamese Americans. *Journal of Aging and Health*, 20(4), 420–436. <https://doi.org/10.1177/0898264308315855>

- [Cited Here](#) |
- [Google Scholar](#)

Perrig-Chiello P., Spahni S., Höpflinger F., Carr D. (2016). Cohort and gender differences in psychosocial adjustment to later-life widowhood. *Journals of Gerontology, Series B: Psychological Sciences and Social Sciences*, 71(4), 765–774. <https://doi.org/10.1093/geronb/gbv004>

- [Cited Here](#) |
- [Google Scholar](#)

Rendall M. S., Weden M. M., Favreault M. M., Waldron H. (2011). The protective effect of marriage for survival: A review and update. *Demography*, 48(2), 481–506. <https://doi.org/10.1007/s13524-011-0032-5>

- [Cited Here](#) |
- [Google Scholar](#)

Your Privacy

To give you the best possible experience we use cookies and similar technologies. We use data collected through these technologies for various purposes, including to enhance website functionality, remember your preferences, show the most relevant content, and show the most useful ads. You can select your preferences by clicking the link. For more information about cookies, please review our [Privacy & Cookie Notice](#)

Reject All Cookies

Accept All Cookies

[Manage Cookie Preferences](#)

Health among older adults. <https://doi.org/10.1111/j.1468-2397.2011.00818.x>

Health among middle-aged and elderly men and women. [https://doi.org/10.1016/S0895-4356\(01\)00491-7](https://doi.org/10.1016/S0895-4356(01)00491-7)

Long-term associations between weight and health. *Journal of Public Health*

Sarah T. S., Richard S. (2014). The effect of widowhood on husbands' and wives' physical activity: The cardiovascular health study. *Journal of Behavioral Medicine*, 37(4), 806–817. <https://doi.org/10.1007/s10865-013-9532-7>

- [Cited Here](#) |
- [Google Scholar](#)

Schnittker J., Bacak V. (2014). The effect of widowhood on husbands' and wives' physical activity: The cardiovascular health study. *Journal of Behavioral Medicine*, 37(4), 806–817. <https://doi.org/10.1007/s10865-013-9532-7>

- [Cited Here](#) |
- [Google Scholar](#)

Shah S. M., Carey I. M., et al. (2014). Circumstances protect or harm? A study of the circumstances that protect or harm the health of older adults. *Epidemiology*, 176(8), 600–605. <https://doi.org/10.1093/epid/khu080>

- [Cited Here](#) |
- [Google Scholar](#)

The Directorate General of Statistics of the Republic of Indonesia. (2016). *Statistics of national health and material living conditions*. Jakarta: Badan Pusat Statistik. <https://doi.org/10.1093/epid/khu080>

- [Cited Here](#) |
- [Google Scholar](#)

Vaupel J. W., Carey J. R., Christensen K. (2003). It's never too late. *Science*, 301(5640), 1679–1681. <https://doi.org/10.1126/science.1090529>

- [Cited Here](#) |
- [Google Scholar](#)

Wee C. C., Davis R. B., Hamel M. B. (2008). Comparing the SF-12 and SF-36 health status questionnaires in patients with and without obesity. *Health and Quality of Life Outcome*, 6, Article 11. <https://doi.org/10.1186/1477-7525-6-11>

- [Cited Here](#) |
- [Google Scholar](#)

Weiss W. M., Vu A., Tappis H., Meyer S., Haskew C., Spiegel P. (2011). Utilization of outpatient services in refugee settlement health facilities: A comparison by age, gender, and refugee versus host national status. *Conflict and Health*, 5, Article 19. <https://doi.org/10.1186/1752-1505-5-19>

- [Cited Here](#) |
- [Google Scholar](#)

Wolinsky F. D., Miller T. R., Malmstrom T. K., Miller J. P., Schootman M., Andresen E. M., Miller D. K. (2008). Self-rated health: Changes, trajectories, and their antecedents among African Americans. *Journal of Aging and Health*, 20(2), 143–158. <https://doi.org/10.1177/0898264307310449>

- [Cited Here](#) |
- [Google Scholar](#)

Wu S., Wang R., Zhao Y., Ma X., Wu M., Yan X., He J. (2013). The relationship between self-rated health and objective health status: A population-based study. *BMC Public Health*, 13, Article 320. <https://doi.org/10.1186/1471-2458-13-320>

- [Cited Here](#) |
- [Google Scholar](#)

Your Privacy

To give you the best possible experience we use cookies and similar technologies. We use data collected through these technologies for various purposes, including to enhance website functionality, remember your preferences, show the most relevant content, and show the most useful ads. You can select your preferences by clicking the link. For more information about cookies, please review our [Privacy & Cookie Notice](#)

Reject All Cookies

Accept All Cookies

[Manage Cookie Preferences](#)

S One, 9(1), e84933.

health and material
American Journal of

ran, ROC. (2016).
[t.asp?xItem=40131](#)

- [Cited Here](#) |
- [Google Scholar](#)

Younsi M. (2015). Health Health Survey. *Value in*

- [Cited Here](#) |
- [Google Scholar](#)

Keywords:

self-rated health; multi

Copyright © 2018 Taiw

[View full article text](#)

[^Back to Top](#)



Your Privacy

To give you the best possible experience we use cookies and similar technologies. We use data collected through these technologies for various purposes, including to enhance website functionality, remember your preferences, show the most relevant content, and show the most useful ads. You can select your preferences by clicking the link. For more information about cookies, please review our [Privacy & Cookie Notice](#)

[Reject All Cookies](#)

[Accept All Cookies](#)

[Manage Cookie Preferences](#)

ation using the SF-12
[ri.2015.07.004](#).

Never Miss an Issue

Get new journal Tables of Contents sent right to your email inbox

[Get New Issue Alerts](#)

Browse Journal Content

- [Most Popular](#)
- [For Authors](#)
- [About the Journal](#)
- [Past Issues](#)
- [Current Issue](#)
- [Register on the website](#)
- [Get eTOC Alerts](#)

For Journal Authors

- [Submit an article](#)
- [How to publish with us](#)

Customer Service

- Contact us at:
 - Support:
[Submit a Service Request](#)

- [Manage Cookie Preferences](#)

-
-
- [Privacy Policy](#)
- [Legal Disclaimer](#)
- [Terms of Use](#)
- [Open Access Policy](#)
- [Feedback](#)
- [Sitemap](#)
- [RSS Feeds](#)
- [LWW Journals](#)
- [Your California Privacy Notice](#)
- Copyright © 2026
- Taiwan Nurses Association. All rights reserved. Reproduction or translation without permission is not permitted. For more information, please contact the Association.

Your Privacy

To give you the best possible experience we use cookies and similar technologies. We use data collected through these technologies for various purposes, including to enhance website functionality, remember your preferences, show the most relevant content, and show the most useful ads. You can select your preferences by clicking the link. For more information about cookies, please review our [Privacy & Cookie Notice](#)

Reject All Cookies

Accept All Cookies

[Manage Cookie Preferences](#)

Intelligence training is