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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

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 identifie gly with self-rated health for widowed olde ool by the National Health Insurance Syste fficials who are responsible for develop ed in Taiwan.

Introduction

Taiwan is a rapidly agin ver is projected to increase to 20% of the t has also been increasing in Taiwan. N t from The Directorate General of Budget, Accounti average life expectancy was 79.8 in icates that many older adults are not hea

Older adults, particular ose spouses are still alive. Widowed older ad mpact on their health and survival rate Moon, Glymour, Vable, Liu, & Subramanian, 2013; led as one 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

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, particular) fill this gap, this study aimed to examine s in Taiwan.

Methods

Design

The data used in this re (NHIS) in Taiwan. The NHIS adopted a mu g to geographic location and urbanizati d of probability proportional to size was ct, the second-stage sampling regions, *lins*, v useholds were selected randomly from ved and investigated by trained interviewers

Sample

The original NHIS samp program, 25,632 participants completed and valid survey responses (valid response rate = ~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

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 medic lentistry were considered as healthcar of 1 if the participant took Wester ceived emergency medical treatment, inpa participant did not. In line with prior resear sed healthcare resources might have w

Control variables

To control the variables s, widows, chronic diseases, and healthcar ., 2015; French et al., 2012; Li et al., 2011) and c unger than 75 years), educational level (less o rangements (living alone or with others), li icit or surplus). On the basis of the findings 09), it was hypothesized that older SRH status and that those who lived alone w members.

Ethics

The National Health Research Institutes approved the use of NHIS data for analysis. Furthermore, this study was approved by the research ethics committee (NCUEREC 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

(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 th…nic disease, and healthcare utilization. F…risks are shown in Table 2. In terms of age…rent life status, and relatively poor economi…y peers than the average peers. The RRR…ary school education, lived alone, v…us were significantly higher among the unhea…RRs (2.12, 95% CI [1.77, 2.54]). In addition…icant effects on healthy and unhealthy p…5.710, $\chi^2(12)$ = 254.81) and p value illu…on analysis was used.


TABLE 2.:
Sociodemographi…

Table 3 shows the preva… SRH, including 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.


TABLE 5.:
Self-Rated Health Estimation Between Elderly Widower and Widow

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 lization variables.

Discussion

This study focused on d factors, healthcare utilization status, and cl dicate that age, educational level, living RH significantly. The RRRs of unhealthy ic diseases. Similar results were found for h research (Ho, 2016; Moon et al., 2013; Wu et al., sess their health status.

Notably, most widowed widows and 25.62% for widowers) of the sul s unhealthy proportion was slightly leanwhile, only 26.4% (28.7% for widov "good," a proportion similar to the 24.1% tha vement on health appears to be similar be hat China and 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

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 betwee bly, larger RRRs were found for emergen pared with the average groups. It is wi including hospital stays and emergency tre t (Ho, 2008). Therefore, widowed old r concern about their future, which is reflecte roups. Another area worthy of attention is th y groups when compared with the aver e (e.g., huang lian, jue ming zi, and mai me se people purchase and use traditional Chir derstanding of health that prevention is bette lts who habitually purchased and used tra ival rate than those who did not (Molarius & . (2014); Kudenchuk, Stuart, Husain, Fahrenbruch ues that outpatient healthcare has the pote risk.

Despite what were men erved for widowers in the healthy groups, indi dows. In general, many older men rely he minding to take medication, visiting doctors, and exercising regularly (Kendall, Weden, 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

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.

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