Depression in Older Residents With Stroke Living in Long-Term Care Facilities

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ABSTRACT

Background: Stroke is the third leading cause of death in Taiwan. Poststroke older adults are often admitted to long-term care facilities. The impacts of the two concurrent life events of stroke and relocation may increase the risk of depression in stroke survivors. Depression in elderly stroke survivor residents of long-term care facilities has not been studied.

Purpose: This study explores the factors associated with depression in older residents with stroke living in long-term care facilities.

Methods: A cross-sectional design was used. Twenty-three institutions in southern Taiwan participated in this study, including seven nursing homes, 11 intermediate-care facilities, and five domiciliary-care facilities. Purposive sampling enrolled 111 participants who met the following inclusion criteria: 65 years or older, experienced a stroke that did not cause cognitive deficits, and capable of verbal communication. Data were collected using a sociodemographic data questionnaire, Barthel’s Index, and the Taiwan Geriatric Depression Scale.

Results: Depression was experienced by 41 of the 111 participants (36.9%). Prevalence of depression was 45.7% in nursing homes, 36.2% in intermediate-care facilities, and 22.2% in domiciliary-care facilities. Participants living in nursing homes and intermediate-care facilities and illiterate participants with low Barthel’s Index scores showed more depressive symptoms.

Conclusions/Implications for Practice: Healthcare providers should conduct depression screening for elderly residents with stroke on admission to long-term care facilities. Regular assessment and monitoring of depressive symptoms, especially in residents with less formal education and limited physical functions, are important in nursing homes and intermediate-care facilities.

KEY WORDS:
activity of daily living, depression, long-term care facility, older resident, stroke.

Introduction

Adults older than 65 years face an increased risk of cerebrovascular problems (Chen, Balami, Esiri, Chen, & Buchan, 2010). This group constitutes roughly 11.15% of the population of Taiwan (Ministry of the Interior, 2012a). Cerebrovascular accident, also known as stroke, is the third leading cause of death in Taiwan (Ministry of Health and Welfare, 2013). Stroke may impair motor, sensory, and perception functions and lead to dependence in activities of daily living (ADLs; Robinson, 2003). The loss of independence in ADLs necessitates that older adults with stroke receive a great deal of care, which leads to many elderly patients with stroke moving into long-term care facilities (LTCFs; Farner et al., 2010; Lee & Choi, 2002). Nursing homes (NHs), intermediate-care facilities (ICFs), domiciliary-care facilities (DCFs), and dementia care institutions are the different types of LTCFs in Taiwan. In Taiwan, NHs provide nursing care to patients with long-term chronic diseases, ICFs serve individuals who lack the capacity to take care of themselves, and DCFs offer housing to people who can take care of themselves in daily life (Ministry of the Interior, 2012b).

Long-term residence in LTCFs has been associated with prevalence of depression in older residents at a rate that is three to four times higher than in community-dwelling peers (Jongenelis et al., 2004). In Taiwan, the prevalence of depression among older residents in LTCFs has been reported to range from 39% to 82% (Lin, Wang, Chen, Wu, & Portwood, 2013).
have residents who met our inclusion criteria. Therefore, 23 LTCFs composed the target sample for this study. The directors of the LTCFs referred residents to the researchers. Inclusion criteria for this study required that LTCF residents be 65 years or older, to have experienced a physician-diagnosed stroke, and be cognitively intact. The Short Portable Mental Status Questionnaire assessed cognition, with a score of >8 required for eligibility (Pfeiffer, 1975). This study applied a purposive sampling methodology. Residents unable to communicate in Mandarin or Taiwanese and those exhibiting aphasia were excluded. A minimum sample size of 109 subjects was determined using G*Power 3.0 software (Faul, Erdfelder, Lang, & Buchner, 2007), with the power set at .80, the α at .05, and the effect size at .262 in accordance with Cheng et al. (2005).

### Data Collection

Several instruments were used to assess the presence of depression and its associated variables. Demographic information was obtained from medical records and confirmed by nurses at the institutions. Barthel’s Index (BI) assessed basic ADLs (BADLs). The Taiwan Geriatric Depression Score (TGDS) assessed participants’ self-reported depressive symptoms. The researcher read scale items to participants who were unable to read or were illiterate.

### Measurements

#### Barthel’s Index

The BI, developed by Mahoney and Barthel (1965), assesses BADL in terms of respondent abilities related to feeding, bathing, grooming, dressing, bowel and bladder control, toilet use, transfer, mobility, and chair use. Researchers use observation or participant inquiry to assess each BI item. The BI scores range from 0 to 100, with higher scores representing higher independence in performing BADLs. A total BI score of 0–20 correlates with total dependence, 21–60 correlates with severe dependence, 61–90 correlates with moderate dependence, 91–99 correlates with slight dependence, and 100 correlates with total independence. The Chinese version was tested in older populations, with Cronbach’s alpha ranging from .79 to .85 (Shyu, Tang, Tsai, Liang, & Chen, 2006). The Cronbach’s alpha for the current study was .93.

#### Taiwan Geriatric Depression Scale

The TGDS, developed by Liao et al. in 2004, is a 30-item dichotomous scale. Older adults are asked to answer “yes” or “no.” Each “yes” is scored as 1, and each “no” is scored as 0. Scores range from 0 to 30 points, with higher scores indicating greater depression. The optimal cutoff point for older adults is a score of 15; scores exceeding the cutoff point indicate that depression is likely. Liao et al. (2004) reported a reliability of .94 (Kuder–Richardson 20). The Kuder–Richardson 20 score for the current study was .87.
Ethical Considerations
Ethical approval was obtained from the institutional review board of the university. An information sheet was given to all participants. Participants signed written consent forms before data collection. Participant anonymity was assured. Furthermore, participants were informed that they could withdraw from the study at any time without affecting their rights to receive healthcare.

Data Analysis
SPSS v.17.0 was used to analyze the data (SPSS, Inc., Chicago, IL, USA). Descriptive analyses described participants’ demographic and disease characteristics. Because assumptions of distribution normality were not met, data were analyzed using the Mann–Whitney U tests and Kruskal–Wallis tests to compare intergroup differences. The Bonferroni method was used to adjust the p value based on the number of tested comparisons. Spearman correlation explored the relationships between variables. The hierarchical multiple regression model investigated the key factors associated with depression. Three hierarchical multiple regression models were tested. The first model controlled for demographic data (e.g., gender, age, and educational level), the second model added BI as an independent variable, and the third model examined institution type to identify predictors of depression. Categorical variables were converted into dummy variables. Illiterate residents were used as the reference group for the education variable, and DCF was used as the reference group for the type of institution. A reported p value below .05 was considered statistically significant.

Results
Relationships Among Sociodemographic Characteristics, Physical Function, and Depression
The 23 target LTCFs invited to participate included seven NHs, 11 ICFs, and five DCFs. Four hundred fifteen older residents with stroke were approached. Cognitive disorders excluded 135 residents; frailty, discomfort, or refusal excluded 132 residents; and 37 were excluded because of inability to communicate. One hundred eleven (26.7%) residents provided complete data. Data were collected from October 2008 through April 2009. More than half (n = 58, 52.3%) were living in ICFs. Ages ranged from 65 to 100 years (mean = 76.38, SD = 6.89). Three quarters were illiterate or had only an elementary school education (n = 84, 75.7%). Most (n = 92, 82.9%) had experienced one cerebrovascular accident only. Nearly all (n = 107, 96.4%) had developed hemi-paralysis, with the remaining four experiencing quadri-paralysis. The mean (SD) score for BI was 44.14 (33.47), indicating severe dependence in BADL. The mean (SD) score for TGDS was 12.55 (6.60), with a range of 1–27. More than one third of the participants (n = 41, 36.9%) scored higher than 15, indicating depression. Prevalence of depression in NHs, ICFs, and DCFs was thus 45.7% (n = 35), 36.2% (n = 21), and 22.2% (n = 4), respectively. Table 1 presents demographic data.

Educational level significantly affected participant depression scores (χ² = 7.499, p < .05). Bonferroni adjustments showed that older residents with stroke who were illiterate experienced higher levels of depression than those with a junior high school education and above. Type of institution also significantly affected participant depression scores (χ² = 10.735, p < .01). Bonferroni adjustments showed that older residents with stroke in NHs and ICFs had higher depression scores than those in DCFs (Table 1).

Correlation of Demographic Characteristics, Physical Function, and Depression
A Spearman correlation was performed to determine the relationship between variables. Age was not significantly correlated with depression level (r = −.094, p = .327), whereas a negative and significant correlation was found between BI and depression (r = −.203, p = .033; Table 1).

Factors Contributing to Depression
This study tested three hierarchical multiple regression models. The first model controlled for demographic data, with results showing that illiterate participants had a higher incidence of depression than those with a junior high school education. In the second model, BI was added as an independent variable, with results showing that illiteracy and low BI score were significant predictors of depression (F = 3.443, p = .006). In the third model, institution type was added to identify important predictors of depression. A collinearity diagnosis of independent variables showed a tolerance result greater than .1 and variance inflation factors below 10, indicating the absence of multicollinearity among the independent variables (Hair, Black, Babin, Anderson, & Tatham, 2006). Results from the third model indicate type of institution (e.g., NH and ICF) and lower BI scores as significant predictors of depression (F = 3.351, p = .003). All variables explained 19% of the variance in depression (Table 2).

Discussion
The current study investigated the incidence of depression in elderly stroke survivor residents of LTCFs in Taiwan. The mean (SD) score for TGDS in this study was 12.55 (6.60). More than one third (36.9%, n = 41) of the participants exceeded the depression scale cutoff score, suggesting that they were likely depressed. Our findings supported the 2011 study of Dragset et al. (2011), which reported that depression is a major health problem among NH residents. Moreover, the depression prevalence identified in this study was somewhat higher than in previous studies, which found a prevalence
ranging between 27% and 33.3% in community settings (Cheng et al., 2005; Hackett et al., 2005; Li et al., 2003). The three previous studies in Taiwan that measured depression in older LTCF residents found depression prevalence in the 39%–82% range (Lin et al., 2004, 2005, 2007). Because the current study excludes residents with cognitive impairment,
Overall, depression prevalence in Taiwan LTCFs may be underestimated.

This study confirmed that a lower level of education, especially illiteracy, correlates closely with increased depression risk in older adults with stroke. This finding is similar to the study results of Lin et al. (2007, 2005), which indicate that individuals with lower educational levels may be less aware of resources available to cope with depression. Illiterate residents may be less likely to communicate their symptoms after stroke. Therefore, LTCFs should develop specific strategies to deliver effective healthcare to older residents with stroke who are illiterate and/or of lower socioeconomic status (Fernandes et al., 2012). This study identified no association between depressive symptoms and any of the following variables: gender, age, marital status, religion, other disease characteristics including stroke recurrence, concomitant diseases, paralysis, reason for institutionalization, or duration of institutionalization. These results were consistent with previous studies of depression in older patients with stroke (Cheng et al., 2005; Li et al., 2003). However, previous studies of community-dwelling patients with stroke suggested that being a woman (Liao et al., 2004), being older (Farner et al., 2010), and having a higher risk of stroke recurrence (Yuan et al., 2012) were significantly associated with depression symptoms. More studies are needed to confirm our research findings regarding the relationships between demographic data and depression in older residents of LTCFs with stroke.

Stroke often occurs suddenly and disables patients physically as well as emotionally. This study found depression scores to be significantly and negatively correlated with ADL scores, with higher ADL scores correlating with fewer depression symptoms, which is consistent with previous studies (Cheng et al., 2005). In addition, a poor ADL score was found to be a significant predictor for depression, which is also consistent with previous studies (Drageset et al., 2011; Lin et al., 2007). Depression may promote further deterioration of physical function and lead to a vicious cycle (Richardson, Bedard, & Weaver, 2001). Robinson’s (2003) study indicated that effectively treating poststroke depression may enhance the recovery of ADL independence. Another study found that therapeutic exercise may reduce depression symptoms in patients after a stroke (Lai et al., 2006).

The results of the current study show that the prevalence of depression in older residents with stroke varies at different facilities. Participants at NHs (45.7%) and ICFs (36.2%) showed higher depression scores than those at DCFs (22.2%). In Taiwan, NHs are qualified to admit residents with tracheal tubes, nasogastric tubes, and urinary catheters. Therefore, residents in NHs are usually more physically dependent and require more nursing care than those in ICFs and DCFs (Ministry of the Interior, 2012b). The residents in ICFs have considerable self-care deficits, whereas most DCF residents are able to care for themselves (Ministry of the Interior, 2012b). Although residents of these three institutions have various care-need levels, we found no difference in terms of BI scores. However, the surrounding environment will affect stroke survivors who are cognitively intact but face disability limitations. Farner et al. (2010) conducted a 13-month follow-up study on the depression symptoms of older patients with stroke and found that symptoms in the institution-dwelling older adults were worse than their home-dwelling peers and that continuous depression may lead to worse overall functioning. Therefore, we suggest that the emotions of residents living in NHs may be influenced by the poor physical conditions around them. Future study is needed to consider the environmental impact factors that influence depression in older residents with stroke.

BI, NH, and ICF together accounted for only 19% of the total variance in depression. This suggests that other confounding factors exist behind depression. Antidepressant medicine (Cheng et al., 2005; Lin et al., 2005), which was not examined in this study, is one identified factor. Social support has also been associated with lower levels of depression in patients with stroke and older adults living in LTCFs (Li et al., 2003; Lin et al., 2007).

This study was limited by several constraints. First, older residents with stroke in care facilities who had cognitive deficits, were not able to communicate, or had aphasia were excluded. Second, because a cross-sectional descriptive study design investigated the correlations between selected variables and participants’ depression and physical function, cause-and-effect relationships and the situations in other populations cannot be inferred. Future research should include longitudinal

**TABLE 2.**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Model 1 β</th>
<th>Model 2 β</th>
<th>Model 3 β</th>
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<tr>
<td>Gender</td>
<td>−0.08</td>
<td>−0.10</td>
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<tr>
<td>Age</td>
<td>−0.149</td>
<td>−0.182</td>
<td>−0.177</td>
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<td>Educational level</td>
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<td>Ref</td>
<td>Ref</td>
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<tr>
<td>Elementary school</td>
<td>−0.094</td>
<td>−0.072</td>
<td>−0.039</td>
</tr>
<tr>
<td>Junior high school and above</td>
<td>−0.315*</td>
<td>−0.271*</td>
<td>−0.198</td>
</tr>
<tr>
<td>Barthel’s Index</td>
<td>−0.240*</td>
<td>−0.197*</td>
<td></td>
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<tr>
<td>Type of institution</td>
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<td></td>
</tr>
<tr>
<td>DCF</td>
<td>Ref</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NH</td>
<td>.299*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ICF</td>
<td>.291*</td>
<td></td>
<td></td>
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<tr>
<td>$R^2$</td>
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<td>.141</td>
<td>.186</td>
</tr>
<tr>
<td>$F$</td>
<td>2.503</td>
<td>3.443</td>
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</tr>
<tr>
<td>$p$</td>
<td>.047**</td>
<td>.006**</td>
<td>.003**</td>
</tr>
</tbody>
</table>

Note. DCF = domiciliary care facility; NH = nursing home; ICF = intermediate care facility. 
*p < .05. **p < .01.
follow-up studies to investigate changes in depression patterns in this population. Third, this study employed purposive sampling to recruit participants from LTCFs located in southern Taiwan. Therefore, results may not apply to all older residents in care facilities. Finally, the TGDS used in this study was developed specifically for older Taiwanese, with a cutoff point set based on clinically relevant symptoms and culture. Previous studies have supported the reliability of the TGDS measurement and application (Bai, Chiou, Chang, & Lam, 2008; Chung, Chiou, & Chou, 2009).

Conclusions
This study found a higher depression incidence in older residents of NHiCs and ICFs with stroke who were illiterate and/or had poor ADL functions. Moreover, 36.9% of older residents with stroke earned scores indicating that they were highly depressed. Therefore, we recommend that managers and healthcare providers working in care facilities conduct regular screenings and assessments for depression with older residents to facilitate early detection and treatment. In addition, care facilities should provide regular education and training for their caregivers to enhance staff capabilities in terms of identifying the signs and symptoms of depression in older residents. Level of depression relates closely to ADL function recovery in older residents with stroke. Therefore, older stroke residents should be encouraged to participate in physical rehabilitation to prevent further depression, facilitate recovery, and improve quality of life.

References


長期照護機構中風老人憂鬱之探討

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背景
在台灣中風為死亡原因之第三位，中風後老人由於失能或照顧之需要而入住長期機構，中風與長期照護的兩種生活事件之衝擊，可能使中風存活者傾向憂鬱。然而目前缺乏長期照護機構中風老人憂鬱之研究。

目的
探討長期照護機構中風老年住民憂鬱的相關因素。

方法
採橫斷式研究，於南台灣共23家長期照護機構參與本研究，包含7間護理之家、11間養護中心及5間安養機構。以立意取樣，選取65歲以上有中風病史的住民，排除認知及溝通障礙者。資料收集包含社會人口學資料、巴氏量表及台灣老人憂鬱量表。

結果
共111位中風老年住民參與本研究，結果36.9%（n = 41）之中風老年住民有憂鬱情形，中風比率分別是護理之家45.7%、養護中心36.2%、安養中心22.2%。護理之家及養護機構、不識字及低巴氏分數的老年中風住民顯示較多的憂鬱症狀。

結論
健康照護者需針對中風老人入住機構時進行憂鬱篩選，並定期評估及監測老人的憂鬱狀況，特別是低教育、身體功能差、及居住於護理之家及養護中心的老年住民，需特別關注憂鬱的適當照護。

關鍵詞：日常生活功能、憂鬱、長期照護機構、老年住民、中風。

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