Health promotion behaviors in Chinese family caregivers of patients with stroke

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SUMMARY
The purpose of this study was to explore the relationship between and among the caregiver’s personal factors, the care recipient’s functional status, the caregiver’s perceived self-efficacy, social support, reactions to caregiving, and health promotion behaviors in family caregivers of community-dwelling stroke patients in Taiwan. A structured home-interview survey methodology was used to collect data from 134 primary caregivers responsible for care of stroke patients in Taipei, Taiwan. The study results indicated that, in general, caregivers were female spousal caregivers (mean age 52 years, average caregiving period 24 months). Regression analyses revealed that the caregiver’s health status was the strongest positive predictor of caregiver self-efficacy. Spousal caregivers with a better-perceived health status were more satisfied with their resources of social supports. Spousal caregivers with poor perceived health status had a higher level of caregiving strain. Results for the overall model indicated caregiver’s social support and the care recipient’s functional status made significant contributions in explaining the caregiver’s health promotion behaviors. Implications for further practice suggest establishing community training programs and support groups for family caregivers.

Key words: caregiving; health promotion; self-efficacy; social support

INTRODUCTION
Since 1982, cerebrovascular disease has been the second leading cause of death for persons of all ages and the leading cause of death for those aged 65 years or over in Taiwan (National Health Administration, 2000). A hospital-based stroke registry revealed that among 2640 stroke cases in northern Taiwan, the long-term survival rate after a stroke was 84.6% for the first month, 74.3% for the first year and 67.7% for the second year (Hung and Chen, 1993). Lee reported that 31% of stroke survivors had functional impairments, resulting in partial to total dependence on others for completion of daily activities (Lee, 1989). Formal health care and social service resources for post-stroke care in Taiwan are limited.

Most post-stroke patients are not institutionalized and remain at home (Hu et al., 1992). A significant source of care for disabled people in Taiwan are patients’ families, because social values are such that families are responsible for their disabled family members. The demands of caregiving may cause insufficient rest, interrupted sleep, chronic fatigue, economic hardship and depression—all of which place caregivers at risk for emotional and physical problems (George and Gwyther, 1986; Decker and Young, 1991; Williams, 1994). In addition, caregivers may neglect or postpone care for themselves.

The benefits of adopting a health lifestyle include enhancing the quality of life, increasing longevity, decreasing health care costs, and increasing productivity by decreasing illness and absenteeism. While much has been researched and published regarding the need for and
benefits of health promotion, caregivers have not been the major focus of research in health promotion. Among many key factors affecting the caregivers’ health promotion practices are caregiving self-efficacy, social support and reactions to caregiving. Burton and colleagues (Burton et al., 1997) found that caregivers with a low level of caregiving self-efficacy had negative health behaviors compared with caregivers with a high level of self-efficacy. Health promotion practices of caregivers may contribute to the health and well-being of caregivers and the welfare of stroke patients. Unfortunately, health care providers often neglect health promotion and disease prevention for family caregivers (Jackson and Cleary, 1995). Thus, the purposes of the present study were to explore the predictors of caregiving self-efficacy, social support and reactions to caregiving, and to investigate factors related to health promotion behaviors in family caregivers of stroke patients.

PREVIOUS RESEARCH AND VARIABLES UNDER INVESTIGATION

Individual characteristics and experiences
Key characteristics of the caregiver are known to influence caregiving and its consequences. Particularly important is poor health, which has been associated with caregiving strain, less confidence in caregiving tasks, dissatisfaction with social support, and less participating health promotion behaviors (George and Gwyther, 1986; Killeen, 1989; Schumacher et al., 1993; Haley et al., 1996). Additionally, Killeen found that the older, more educated caregivers, who had provided care for shorter periods of time, reported engaging in more health promotion behaviors (Killeen, 1989). Employment status of the caregiver (Stull et al., 1994) and relationship with the care recipient (Horowitz, 1985; Pruchno et al., 1990) were also included because employed wives involved themselves less frequently in health promoting behaviors (O’Brien, 1993). Employment status of the caregiver (Stull et al., 1994) and relationship with the care recipient (Horowitz, 1985; Pruchno et al., 1990) were also included because employed wives involved themselves less frequently in health promoting behaviors (Killeen, 1989). Employment status of the caregiver (Stull et al., 1994) and relationship with the care recipient (Horowitz, 1985; Pruchno et al., 1990) were also included because employed wives involved themselves less frequently in health promoting behaviors (Killeen, 1989). Employment status of the caregiver (Stull et al., 1994) and relationship with the care recipient (Horowitz, 1985; Pruchno et al., 1990) were also included because employed wives involved themselves less frequently in health promoting behaviors (Killeen, 1989).

Household income was investigated because high income, which may assist caregivers to purchase more social support services, allows caregivers to engage in health promotion activities (Pohl et al., 1994; Allen-Holmes, 1997).

Research on the impact of illness characteristics of care recipient on caregiver outcome is mixed. Some investigators have found that severity of care recipient impairment contributes to caregiver strain and burden (Wu et al., 1992; Lalonde and Kasprzyk, 1993; Stull et al., 1994; Dorfman et al., 1996). Other investigators, in contrast, reported that the care recipient’s functional status had no relationship to the caregiver’s reactions (Zarit et al., 1980; Given et al., 1990). In fact, O’Brien found that wives who were caring for husbands with more physical limitations reported less participation in health promotion activities than wives who were caring for less impaired husbands (O’Brien, 1993).

Behavior-specific cognitions
Gillis completed an integrative review of the research literature, published between 1983 and 1991, which focused on identifying the determinants of a health-promoting lifestyle (Gillis, 1993). The results indicated that self-efficacy was the strongest predictor of a health-promoting lifestyle. Dorfman and colleagues examined the factors relating the satisfaction and strain in wife caregivers of frail elderly veterans, suggesting that self-efficacy is important to the caregivers’ general sense of life satisfaction (Dorfman et al., 1996). Archbold and colleagues (Archbold et al., 1990) and Mowat and Laschinger (Mowat and Laschinger, 1994) also found that caregivers who exhibited higher levels of self-efficacy demonstrated lower levels of depression. In general, the literature supports the relevance of enhancing self-perception of efficacy in an attempt to affect health positively. We therefore predicted that confidence in ability to manage caregiving tasks would be positively related to health promotion behaviors among family caregivers of stroke patients. Examining the influence of caregiver self-efficacy on health promotion behaviors will broaden the existing knowledge base in this area.

An increasing body of knowledge suggests that caregivers of stroke patients who have been providing care for an extended time and who have low social support may be at high risk for psychological distress or depression. Based on previous research (Alexy, 1991; Tuohing, 1991; Wyatt, 1991; Stuifbergen, 1995; Terborg et al., 1995), investigators suggest that the perceived level of social support has a strong positive association with participation in health promotion practices.

From the association posited by Pender (Pender, 1996), the reactions to caregiving reflect the caregiving ‘environment’ affecting the caregiver.
Some studies suggest that reactions to caregiving have been conceptualized negatively as burdens, strains or stressors, producing negative psychological responses (Montgomery et al., 1985; Lawton et al., 1989; Given et al., 1990). Archbold et al. conducted interviews with six families, each with a dependent elder at home, in an attempt to identify problems generated by the caregiving situation (Archbold et al., 1990). The major problems stemming from the caregiving role were lifestyle change, ambivalent feelings toward the elder, decision making and lack of support. We, therefore, predicted that reactions to caregiving would be negatively related to health promotion behaviors among family caregivers.

CONCEPTUAL FRAMEWORK AND HYPOTHESES

Using the Health Promotion Model (Pender, 1996) as a reference, a modified model (Figure 1) is proposed to examine relationships among specific determinants of health promotion behaviors of family caregivers. The model consists of three major factors: (i) individual characteristics and experiences, (ii) behavior-specific cognitions, and (iii) behavioral outcome. Individual characteristics and experiences have included caregiver's age, gender, education, income, employment status, relationship with the patient, number of health problems, health status, length of caregiving and care recipient's functional status. Behavior-specific cognitions have included caregiver self-efficacy, social support and reactions to caregiving. Health promotion behaviors is the outcome variable (Figure 1).

The proposed hypotheses were developed based on findings from previous empirical research (Archbold et al., 1990; Alexy, 1991; Haley et al., 1996) and on the Pender’s Health Promotion Model (Pender, 1996). Hypothesis 1 is that caregiver self-efficacy is predicted by the caregiver’s personal factors—including age, gender, education, income, employment status, relationship with the patient, number of health problems, health status, and length of caregiving—and by the care recipient’s functional status (Barnes et al., 1992; Lin and Chiou, 1995; Moen et al., 1995; Dorfman et al., 1996; Haley et al., 1996). Hypothesis 2 is that social support is predicted by the caregiver’s personal factors and by the care recipient’s functional status (Miller, 1987; Winslow and O’Brien, 1992; Bergman-Evans, 1994; Pohl et al., 1994; Robinson and Steele, 1995). Hypothesis 3 is that reaction to caregiving is predicted by the caregiver’s personal factors and by the care recipient’s functional status (Oberst et al., 1989; Given et al., 1990; Carey et al., 1991; Periard and Ames, 1993; Dorfman et al., 1996; Fredriksen, 1996; Keefe and Medjuck, 1997).

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**Fig. 1:** A conceptual model of health promotion behaviors in Chinese family caregivers of stroke patients.
Pender’s model of health promotion postulates that individual characteristics and experiences affect the health promotion behaviors directly as well as indirectly through behavior-specific cognitions (Pender, 1996). Behavior-specific cognitions are assumed to influence health promotion behaviors directly. From this model, Hypothesis 4 proposes that caregiver self-efficacy, social support and reactions to caregiving have a direct effect on the caregiver’s health promotion behaviors, while controlling for the caregiver’s personal factors and the care recipient’s functional status.

METHODS

Sample
A convenience sample of 134 family caregivers of patients with stroke was recruited from three hospitals and four home health care agencies in Taiwan. The director of each medical clinic and home health care agency was provided with a copy of the purpose of the study, the research questions, the questionnaires and the consent form. After permission was granted to access names, caregivers were contacted by telephone. If family caregivers agreed to participate in the study, the researcher scheduled an in-home visit with the primary caregivers to conduct the appropriate interviews. Eligibility criteria for the study were that the caregiver must: (i) be a family member of a patient with stroke and live in the same house as them; (ii) assume major responsibility in the caregiving; (iii) live in Taipei; and (iv) be able to understand the Chinese language. Caregivers were excluded if stroke patients stayed in nursing homes or hospitals.

The ages of the caregivers ranged from 21 to 90 years [mean ± standard deviation (SD) 52.2 ± 14.6 years] and 75.4% were female. The relationship of the caregivers to the patients with stroke were spouse (49.3%), daughter (20.1%), daughter-in-law (14.9%), son (12.7%) or other relative (3.0%). Approximately 31% of the respondents had annual household incomes between $7229 and $14 458. The sample was primarily unemployed and retired (54.5%). Thirty-eight percent of caregivers had no education or only primary school education. The duration of caring for the care-receiver ranged from 1 month to 15 years (mean 24.1 months). Most of the caregivers rated their health as ‘fair’ (51.5%). The Barthel Index scores ranged from 0 to 100. The mean score for the care recipients was 63.5 (SD 34.6). Thirty-one percent of the care recipients were bedridden and needed full nursing care, 13% were bedridden and needed partial nursing care, 37% could perform some self-care or were independent in a wheelchair, and 19% could live by themselves and were completely independent.

Measures
The functional status of the care recipients was measured with the Barthel Index (Mahoney and Barthel, 1965). The Barthel Index is a 10-item Guttman scale, with scores ranging from 0 to 100. Granger and colleagues (Granger et al., 1979) reported a test–re-test reliability of 0.89. Construct validity was support by factor analysis and yielded a single domain. The Cronbach’s alpha value for the Barthel Index in this study was 0.95.

Caregiver self-efficacy was measured by the Caregiver Self-Efficacy (CSE) instrument. This was derived from the measure of caregiver self-efficacy used by Haley et al. (Haley et al., 1987), which drew on Bandura’s (Bandura, 1982) work on self-efficacy. Using the instrumental activities of daily living (IADL) and the Barthel Index, caregivers rated their confidence in their ability to manage problems successfully. This 17-item scale has scores ranging from 17 to 68. Construct validity was supported by hypothesis testing in which the CSE predicted depression (Haley et al., 1987). The alpha value for CSE in this study was 0.93.

Social support was measured by the Personal Resource Questionnaire (PRQ-85)-Part 1 (Brandt and Weinert, 1987). The PRQ-85-Part 1 presented 10 situational problems for which an individual might seek tangible help. The caregiver was then asked to answer the questions of (i) whether or not the situation had arisen within the previous 6 months, and (ii) how satisfied the caregiver was with any help received, using a six-point scale. McNair and colleagues (McNair et al., 1981) reported convergent validity, as evidenced by moderately high intercorrelations with five other support scales, and discriminant validity was established by low correlation with the Profile of Mood States (POMS). The alpha value for PRQ-85-Part 1 in this study was 0.72.

Reactions to caregiving were measured by the Caregiver Reactions Assessment (CRA), which measures the objective as well as the subjective strains and reactions to the role of caregiver. Developed by Given and colleagues (Given et al.,
1992), the CRA is a 24-item scale consisting of five-point responses. Scores range from 24 to 120.

The internal consistency reliability ranged from 0.80 to 0.90 for five subscales (caregiver esteem, lack of family support, impact on finances, impact on schedule and impact on caregiver health). Construct validation of the CRA involved factor analysis (Given et al., 1992). In this study, CRA had an alpha value of 0.75.

Caregivers’ health promotion behaviors were measured by the Health-Promoting Lifestyle Profile II (HPLP-II), which has reported internal consistency (Cronbach’s alpha value) of 0.94 (Walker et al., 1987). The HPLP-II is a 52-item scale consisting of four-point responses; scores range from 52 to 208. The construct validity was confirmed through factor analysis (Walker et al., 1987). The Cronbach’s alpha for HPLP-II was 0.95 for this study.

**Data analysis**

Bivariate correlations were used to investigate the relationship between each of the independent variables and health promotion behaviors in family caregivers. Multiple linear regression analyses were performed to obtain the best fitting linear regression equations for predicting health promotion behaviors from a set of the independent variables. Intercorrelations, means and standard deviations for all variables are given in Table 1.

For the analyses that follow, the relationship of the caregiver with the stroke patient was scored as 0 (spousal caregiver) or 1 (non-spousal caregiver). Employment status was scored as 0 (without job) or 1 (with job) (Table 1).

Due to the large number of independent variables, only the most theoretically important variables and variables that were significantly related to at least one of the three mediating factors and caregivers’ health promotion behaviors in the bivariate analyses were included in the equations to predict all of three mediating factors (caregiver self-efficacy, social support and reactions to caregiving) and caregivers’ health promotion behaviors. Caregiver’s age was dropped from the equation because it was not significantly related to mediating factors and health outcome in the bivariate analysis, and because of its high correlation with relationship to the patient with stroke ($r = 0.74$). Caregiver employment status was dropped from the equation because it is not a key variable in caregiver health promotion behaviors (Killeen, 1989; O’Brien, 1993). Caregiver gender was included because of its importance in predicting health promotion practices (O’Brien, 1993; Allen-Holmes, 1997; Burton et al., 1997). Intercorrelations between variables were almost all $<0.50$. Residual analysis and examination of measures of collinearity did not reveal any serious violations of the assumptions of multiple regression analysis (Kleinbaum et al., 1988).

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1 = caregiver age; 2 = caregiver gender; 3 = caregiver education; 4 = household income; 5 = caregiver employment status; 6 = relationship with care recipient; 7 = number of caregiver health problems; 8 = length of caregiving; 9 = caregiver health status; 10 = care recipient functional status; 11 = caregiver self-efficacy; 12 = social support; 13 = reactions to caregiving; 14 = caregiver health promotion behaviors.

*p < 0.05; **p < 0.01.
RESULTS

Predicting caregiver self-efficacy

Bivariate correlations between variables in the analyses that follow may be found in Table 1. Caregiver’s self-efficacy was correlated significantly with caregiver’s personal factors, such that family caregivers had a high level of caregiving self-efficacy when the caregivers were spousal and when they had a higher number of health problems. A multiple regression analysis entering variables simultaneously identified predictors of caregiver self-efficacy. Results indicated that these variables accounted for 6.1% (adjusted $R^2$) of the variance [$F(8,125) = 2.09$, $p < 0.05$], with the only significant predictor being caregiver’s health status (see Table 2).

Predicting caregiver’s social support

Bivariate correlations revealed that social support was correlated significantly with caregiver’s personal factors. Family caregivers were satisfied with the resources of social support when they were spousal caregivers, and they rated their own health as good. Results reported in Table 2 of a multiple regression analysis entering all variables simultaneously indicated that these variables accounted for 4% (adjusted $R^2$) of the variance in caregiver social support [$F(8,125) = 1.98$, $p < 0.05$], with significant predictors being relationship to the patient (spousal) and caregiver health status (better).

Predicting reactions to caregiving

The bivariate correlations indicated that family caregivers had a higher level of negative reactions to caregiving when the caregivers had a low income, a high number of health problems, a long length of caregiving time or poor health status, and when care recipients had a low level of functional status. A multiple regression analysis (see Table 2) indicated that significant predictors of reactions to caregiving included whether the family caregivers were spouses and whether they rated themselves as having a high health status. Together, the predictive variables explained 23% (adjusted $R^2$) of the variance in reactions to caregiving [$F(8,125) = 5.92$, $p < 0.001$].

Predicting caregiver’s health promotion behaviors

Bivariate correlations indicated that greater participation in health promotion activities was associated with higher education, higher income, better perceived health status, more satisfaction with social support, and the care recipient having a better functional status.

Hierarchical regression was used to assess the effects of mediating factors (self-efficacy, social support, reactions to caregiving) that may increase participation in health promotion behaviors. The caregiver’s personal factors (gender, education, income, relationship with patient, number of health problems, length of caregiving, caregiver’s health status) and the care recipient’s

Table 2: Summary of multiple regression analyses predicting caregiver self-efficacy, social support and reactions to caregiving

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<th>Social support</th>
<th>Reactions to caregiving</th>
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<td>$R^2$</td>
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<td>Number of caregiver health problems</td>
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<td>Care recipient functional status</td>
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$^a$Denotes the standardized partial regression coefficients; unstandardized partial regression coefficients are available upon request.

$^b p < 0.05$; $^c p < 0.001$. 
functional status was entered first into the equation as a block, followed by the caregiver’s self-efficacy, social support and reactions to caregiving. Standardized regression (beta) coefficients are reported from the end of block entry, with all variables in the equation (Table 3).

### Individual characteristics and experiences

The beta coefficients in Table 3 indicate that caregiver’s educational level and perceived health status, and the care recipient’s functional status were significant positive predictors of caregiver health promotion behaviors, as measured by the HPLP-II. Family caregivers with a higher level of education, better perceived health status, and who cared for stroke survivors with less disability in activities of daily living reported more participation in health promotion activities. Individual characteristics and experiences as a set contributed a significant percentage (17%) to explained variance in caregiver health promotion behaviors.

### Behavior-specific cognitions

Social support was a positive predictor of caregiver health promotion behaviors. In fact, satisfaction with social support was the strongest predictor of caregiver health promotion behaviors ($\beta = 0.40, p < 0.001$). Additionally, reaction to caregiving was a significant positive predictor of caregiver health promotion. Behavior-specific cognitions as a set contributed a significant percentage (13%) to explained variance in caregiver health promotion behaviors.

### DISCUSSION

This study contributes to the understanding of health promotion behaviors of family caregivers, which have not been adequately studied (Killeen, 1989). Results from this study provide baseline information about the relationship of self-efficacy, social support and reactions to caregiving with health promotion behaviors of family caregiving, and information is needed that might suggest new and more appropriate interventions to help them remain healthy.

Comparing hypotheses 1, 2 and 3, the caregiver’s health status influenced all three mediating factors. The relationship with the patient influenced the caregiver’s social support and reactions to caregiving, but not the caregiver’s self-efficacy. In previous studies, investigators found that the health status of caregivers was related to the caregiver’s self-efficacy (Dorfman et al., 1996; Haley et al., 1996). The results of the present study showed that the caregiver’s self-rated health was a significant predictor for caregiver perceived self-efficacy. This finding

### Table 3: Summary of multiple regression analysis predicting health promotion behaviors among family caregivers of patients with stroke

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<td>Caregiver gender</td>
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<tr>
<td>Caregiver education</td>
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<tr>
<td>Household income</td>
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<tr>
<td>Relationship with care recipient</td>
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<tr>
<td>Number of caregiver health problems</td>
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<tr>
<td>Length of caregiving</td>
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<tr>
<td>Caregiver health status</td>
<td>0.22$^b$</td>
<td>0.17</td>
<td>0.17</td>
<td>4.45$^c$</td>
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<tr>
<td>Care recipient functional status</td>
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<tr>
<td>Behavior-specific cognitions</td>
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<tr>
<td>Caregiver self-efficacy</td>
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<tr>
<td>Caregiver social support</td>
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<tr>
<td>Reactions to caregiving</td>
<td>0.18$^b$</td>
<td>0.30</td>
<td>0.13</td>
<td>6.27$^c$</td>
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</tbody>
</table>

$^a$Denotes the standardized partial regression coefficients; unstandardized partial regression coefficients are available upon request.

$^b p < 0.05$; $^c p < 0.001$. 

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indicated that the caregivers with better self-rated health reported more confidence in managing caregiving tasks, and that these caregivers might assist stroke survivors in activities of daily living. Caregivers satisfied with the resources of social support had the following characteristics in common: they were spousal caregivers and they rated their own health as good. The results of the present study showed that the spousal caregivers were more satisfied with their social support than the non-spousal caregivers. Possibly the spouses believed their roles were to care for their ill spouse and not to expect others to help, therefore they were more satisfied with their social supports. Another possibility is that spousal caregivers might have felt obliged to give a socially acceptable answer to show their appreciation that their caregiving was supported. Previous studies showed that the health status of caregivers was related to the caregivers’ satisfaction with social support (George and Gwyther, 1986; Gatz et al., 1990; Neary, 1990; Robinson and Steel, 1995). The results of the present study showed that the caregivers with poor self-rated health reported less satisfaction with their social support. Caregivers who had good health would probably be better able to function in various social roles and to obtain support from their social network when needed.

The caregivers who rated their health as being poor would perceive more strain in caregiving. Previous studies found that the health status of the caregivers was related to the caregivers’ reactions to caregiving (Pratt et al., 1987; Pruchno and Resch, 1989; Given et al., 1990; Lalonde and Kasprzyk, 1993; Pohl et al., 1994; England, 1996). The present study indicated that the caregivers with a poor self-rated health status reported more strain concerning caregiving, and more negative effects on finances and schedules as well as feelings of abandonment (by other family members) and resentment. Perceived poor health may have prolonged the time it took to perform caregiving tasks, resulting in more interruption to the daily schedule of the caregivers. Previous studies have shown that the relationships with the patients are related to reactions to caregiving (Barnes et al., 1992). The results of the present study showed that non-spousal caregivers felt greater strain than spousal caregivers. It may be that spouses feel it is their roles to care for their ill spouse or do not expect others to help and therefore feel less abandoned than the child caregivers, at least initially.

In terms of the caregivers’ health promotion behaviors, results reveal that family caregivers who cared for stroke survivors with less disability, those with a higher level of education, with better perceived health status, with greater satisfaction with the resources of social support and with a higher level of negative reactions to caregiving reported more participation in health promotion behaviors. The findings indicated that social support was the strongest positive predictor of caregiver’s health promotion behaviors, which suggests that social support is important to caregiver’s health promotion behaviors. This result is consistent with the findings of previous studies conducted in the United States (Muhlenkamp and Sayles, 1986; Riffl et al., 1989; Alexy, 1991; Wyatt, 1991; Terborg et al., 1995). Previous studies have indicated that caregivers satisfied with their social-support resources would engage in health promotion behaviors.

The relationship between the reactions to caregiving and health promotion behaviors has not been found. The results of the present study show that the caregivers who felt strain, due to their role as a caregiver, would engage in health promotion behaviors. This finding is difficult to explain. Perhaps caregivers feeling the strain of the role of caregiving responsibility may participate in health promotion activities to maintain their own health. Further research is needed to confirm and explain this relationship.

Some investigators cited self-efficacy as a potential psychosocial predictor of caregiver outcomes (Archbold et al., 1990; Mowat and Laschinger, 1994; Dorfman et al., 1996; Gallant and Connell, 1998). Caregiver self-efficacy, i.e. confidence in managing caregiving tasks, contrary to expectations, did not affect caregivers’ health promotion behaviors in the present study. It is possible that the caregivers’ confidence increases their ability to manage the caregiving tasks. However, the linkage between effective management of caregiving tasks and increased health promotion behaviors of caregiving is unclear. The concept of health promotion is relatively new in Taiwan, and additional time might be needed for caregivers to learn the importance of health promotion to their own health.

Limitations of the study are described as follows. The cross-sectional design did not explain causation. Because a convenience sample was used, the findings cannot be generalized to other populations with characteristics dissimilar to the sample in this study.
Implications for practice

When a family member has a stroke, the entire family often suffers. The situation is especially difficult if only one family member is the caregiver. Social support is an important concept for the health professionals caring for the family caregivers because a caregiver needs as much support as possible from others. Nurses, social workers, counsellors, family life educators and other practitioners can refer clients to, or even establish, community training programs and support groups for stroke survivors as well as family caregivers. In the support groups, caregivers could work on problems together and develop new friendships. In addition, nurses and other health professionals can suggest that caregivers ask their family members and friends to help in specific ways and to commit to certain times to help. This gives others an opportunity to help in useful ways and to provide the caregivers relief from some caregiving responsibility.

Among the individual characteristics, the results indicated that the health of family caregivers was associated with their confidence in managing caregiving tasks (self-efficacy), social support, strain and health promotion behaviors. These findings indicated the need to follow up with caregivers and to refer them to appropriate health care services where necessary. Services such as home-based and hospital-based respite care are examples of important resources for caregivers who are experiencing health problems or ‘burnout’.

Many stroke survivors can be helped by rehabilitation. The findings showed that care recipients with a higher functional status engaged in more health promotion activities. This suggests that health professionals can help stroke survivors decide about and choose the right rehabilitation services or program. The practitioners can educate caregivers about how to help patients without allowing the patients to become too dependent on the caregivers’ services. The practitioners should also advise family caregivers to engage in health promotion practices.

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REFERENCES


(CRA) for caregivers to persons with chronic physical and mental impairments. *Research in Nursing and Health*, **15**, 271–283.


