Factors Related to Caregiver Burden among Family Caregivers of Older Adults with Stroke in Hai Duong, Vietnam

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บทคัดย่อ

การวิจัยนี้มีวัตถุประสงค์เพื่อศึกษาความสัมพันธ์ระหว่างการปฏิบัติกิจวัตรประจำวันของผู้ป่วย ความรู้ของผู้ดูแล ระยะเวลาของการเป็นผู้ดูแล ระยะเวลาในการดูแลผู้ป่วยต่อวัน สัมพันธภาพระหว่างผู้ดูแลและผู้ป่วย สถานะเศรษฐกิจ การรับรู้ภาวะสุขภาพของผู้ดูแล และแรงสนับสนุนทางสังคมกับภาระของผู้ดูแลผู้ป่วยสูงอายุโรคหลอดเลือดสมอง เมืองไฮ่เซือง ประเทศเวียดนาม ผู้วิจัยใช้วิธีการสุ่มอย่างง่าย สุ่มผู้ดูแลผู้ป่วยสูงอายุโรคหลอดเลือดสมองที่พาผู้ป่วยมารับการตรวจรักษาที่แผนกผู้ป่วยนอก โรงพยาบาลทั่วไปเมืองไฮ่เซืองประเทศเวียดนาม จำนวน 120 ราย เก็บรวบรวมข้อมูลระหว่างเดือน เมษายน ถึงเดือน พฤษภาคม พ.ศ. 2559 โดยใช้แบบสอบถามจำนวน 7 ชุด ได้แก่ แบบสอบถามข้อมูลทั่วไป แบบสอบถามการรับรู้ภาวะสุขภาพ แบบสัมภาษณ์ภาระของซาริท แบบวัดแรงสนับสนุนทางสังคม แบบประเมินกิจวัตรประจำวันของบาร์เทล แบบสอบถามสัมพันธภาพระหว่างผู้ป่วยและผู้ดูแล แบบวัดความรู้ในการดูแลผู้ป่วยโรคหลอดเลือดสมองที่มีค่าความเชื่อมั่นเท่ากับ .97 .90 .94 .92 .97 และ .81 ตามลำดับ การวิเคราะห์ข้อมูลใช้สถิติพรรณนา การหาค่าสัมประสิทธิ์สหสัมพันธ์เพียร์สันและสถิติสเปียร์แมน ผลการวิจัยพบว่า

ผู้ดูแลผู้ป่วยสูงอายุโรคหลอดเลือดสมองมีภาระในระดับเล็กน้อยถึงปานกลาง (M=38.18, SD=14.57) การปฏิบัติกิจวัตรประจำวันของผู้ป่วย ความรู้ของผู้ดูแล ระยะเวลาของการเป็นผู้ดูแล สัมพันธภาพระหว่างผู้ดูแลและผู้ป่วย สถานะเศรษฐกิจ การรับรู้ภาวะสุขภาพของผู้ดูแล และแรงสนับสนุนทางสังคมมีความสัมพันธ์ทางลบกับภาระของผู้ดูแลผู้ป่วยสูงอายุโรคหลอดเลือดสมองอย่างมีนัยสำคัญทางสถิติที่ระดับ .01 ส่วนระยะเวลาในการดูแลผู้ป่วยต่อวันมีความสัมพันธ์ทางบวกกับภาระของผู้ดูแลผู้ป่วยสูงอายุโรคหลอดเลือดสมองอย่างมีนัยสำคัญทางสถิติที่ระดับ .01

ผลการวิจัยในครั้งนี้ใช้เป็นข้อมูลพื้นฐานเกี่ยวกับภาระและปัจจัย ที่มีความสัมพันธ์กับภาระของผู้ดูแลผู้สูงอายุโรคหลอดลเอดสมองในประเทศเวียดนาม การวิจัยครั้งต่อไปควรศึกษาปัจจัยทำนายและพัฒนาโปรแกรมการพยาบาล เพื่อลดภาระของผู้ดูแลผู้ป่วยกลุ่มนี้

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Abstract

Objectives: To examine the relationship between patient's activities of daily living, knowledge of caregiver, duration of being a caregiver, time per day for taking care of stroke patient, relationship between caregiver and stroke patient, financial status, caregiver's general health perception, social suppor, and caregiver burden of older adults with stroke in Hai Duong, Vietnam.

Method: Simple random sampling technique was used to recruit 120 family caregivers of older adults with stroke who took the patients to visit the Out-patient Department of Hai Duong Province General Hospital in Vietnam. Data were collected from April to May, 2016 using questionnaires including The Demographic Questionnaire, The Self-Rated Health Questionnaire, The Zarit Burden Interview, The Social Support Scale, The Barthel Activities of Daily Living Index, The Relationship between Caregiver and Stroke Patient Questionnaire, and The Knowledge of Stroke Caregiving with their reliabilities of .97, .90, .94, .92, .97, and .81 respectively. Data were computed using descriptive statistics, Pearson's Product Moment Correlation Coefficients, and Spearman's rank correlations.

Results: The results showed that the family caregiver burden of older adults with stroke was at a mild to moderate level with a mean score of 38.18 (*SD*=14.57). Additionally, caregiver burden negatively related with patient's activities of daily living, knowledge of caregiver, duration of being a caregiver, relationship between caregiver and stroke patient, financial status, caregiver's general health perception, and social support at the significant level of .01, whereas it positively related with time per day for taking care of stroke patient at the significant level of .01.

Conclusion: Findings provided baseline information for burden and its related factors among Vietnamese family caregivers of older adults with stroke. Future research should focus on predicting factors study as well as developing effective nursing interventions to reduce family caregiver burden of this population.

Keywords: Older Adult, Stroke, Burden, Family Caregiver

Introduction

Stroke has been recognized as a worldwide health problem with approximately 15 million people suffering from this disease annually. Of these, 6 millions died and other 5 millions were permanently disabled (World Heart Federation, 2015). It could significantly interfere with the ability to perform daily activities which may lead to physical disability and

impairments in cognition, behavior and communication (Byun & Evans, 2015). In Vietnam, stroke is one of the leading causes of death as 200,000 people suffering from stroke annually and 11,000 of them pass away (Cong, 2007). A survey of 78 provincial hospitals in Vietnam showed that 62.4% of stroke patients were older than 60 years (Ministry of Health-Vietnam, 2008). As a result, stroke has become a significant health problem in Vietnamese elderly people (Le, 2015).

After recovering from stroke, approximately 25 to 50% become partially or totally dependent and more than 90% of them had some health problems during the first year after a stroke (Sharma, Sharma, Lopchan, Thapa, & Rana, 2014). Older adults with stroke could experience increased suffering from the combined effects of stroke and concomitant illnesses, which often can lead to the need for more assistance with daily activities (Limpawattana, Intarasattakul, Chindaprasirt, & Tiamkao, 2015). Thus, family caregivers play an important role in providing care and supporting activities of daily living for them at home. In Vietnam, after discharging from a hospital, almost all stroke survivors returned homes and stayed with their caregivers in the same home and needed help from them. However, family caregivers worried about availability of resources and financial support (Hayashi, Hai, & Tai, 2013). If the stroke had a sudden onset, family members must quickly assume the role of family caregivers without an opportunity to learn new skills, thus, taking care of stroke patients may be a stressful event and caregivers may experience a burden even in the early post stroke period (Byun & Evans, 2015; Limpawattana et al., 2015).

Family caregivers have to provide a holistic care and support to stroke survivors (Hayashi et al., 2013). Providing care may be a chance for caregivers to express of love and concerns with care-receiver as well as made close connections between caregiver and care-receiver (Vellone et al., 2011). However, it could lead to physical, psychological, emotional, social, and financial burdens for the family caregivers (Bhattacharjee, Vairale, Gawali, & Dalal, 2012). Caregiver burden refers to the negative feelings and subsequent strain experienced, and it affects to stroke patients and caregivers' health and well-being (Bhattacharjee et al., 2012). The systematic review showed the prevalence of caregiver burden was 25-54% and remained elevating for an indefinite period following stroke (Rigby, Gubitz, & Phillips, 2009). Other studies indicated that caregivers of stroke patients experience levels of burden (Hassan, Visagie, & Mji, 2011; Jaracz et al., 2015). These burdens depended on various factors associated with both caregivers and stroke survivors.

One of the factors significantly correlated with burden is patient's ADLs. Some studies have shown a low level of patient's ADLs and increased the burden level of caregivers

(Gorgulu, Polat, Kahraman, Ozen, & Aslan, 2016; Yeh & Chang, 2014). A negative correlation is found between caregiver burden and duration of being a caregiver in the study conducted in Malaysia by Zainuddin, Arokiasamy, and Poi (2003). However, duration of being a caregiver did not influence caregiver burden among stroke caregivers in Holland (Van den Heuvel, De Witte, Schure, Sanderman, & Meyboom-de Jong, 2001). Regarding time per day for taking care of elderly with stroke, many studies showed that the numbers of daily hours for taking care of stroke survivors positively related to caregiver burden (Tang, Lau, Mok, Ungvari, & Wong, 2011; Gbiri, Olawale, & Isaac, 2015). Studies about family caregivers stated that family caregivers could be spousal, daughters, daughters in law or even sons (Rigby, Gubitz, & Phillips, 2009; Yeh & Chang, 2014). Family caregivers who had a better relationship experienced a lower caregiving burden (Yeh & Chang, 2014). Additionally, the higher level of caregiver burden was stated in financial area (Rigby et al., 2009). Findings showed a lower level of financial status with a higher level of caregiver burden (Limpawattana et al., 2015; Bhattacharjee et al., 2012). Besides those, knowledge of caregiver was related to caregiver burden (Yeh & Chang, 2014). Caregiver's general health perception may be affected by physical, psychological, emotional and financial status resulting from providing care to stroke survivor. The studies found that general health perception of family caregivers was associated with caregiver burden (Jaracz, Grabowska-Fudala, Gorna, & Kozubski, 2014; Jeong, Jeong, Kim, & Kim, 2015). Moreover, studies stated that social support had negatively correlated with caregiver burden (Chiou, Chang, Chen, & Wang, 2009; Kaur, 2014).

Although, the correlations between caregiver burden and its factors have been conducted outside Vietnam, these areas were still understudied among Vietnamese family caregivers of older adults with stroke. Since stroke is becoming leading cause of several disabilities countrywide including Hai Doung. Additionally, the different culture and context may affect caregiver's burden. Therefore, the understanding about burden of caregivers will provide useful and beneficial information for nurses and health care providers or researchers for better understanding of caregiver burden in Vietnam. Eventually, nursing interventions for reducing caregiver burden of older adults with stroke might be elaborated based on this finding. Therefore, it is necessary to study the level of caregiver burden and examine the associations between the selected factors and family caregiver burden of older adults with stroke in Hai Duong, Vietnam.

Objectives:

To examine the relationship between patient's activities of daily living, knowledge of caregiver, duration of being a caregiver, time per day for taking care of stroke patient,

relationship between caregiver and stroke patient, financial status, caregiver's general health perception, social suppor, and caregiver burden of older adults with stroke in Hai Duong, Vietnam.

Methods

Design and study settings

A descriptive correlational study design was applied into this study. Data collection was conducted at the Out-patient Department of Hai Duong Province General Hospital located in the North of Vietnam from April to May, 2016.

Sample

Samples were 120 family caregivers calculated by using a power analysis with G*Power 3.1.9.2 program (Faul, Erdfelder, Lang, & Buchner, 2007). They are caregivers of older adults with stroke who took the patients to follow up at hospital. They were selected using simple random sampling technique according to inclusion criteria which were: 1) took care of older adults with stroke aged 60 years or older at least 1 month at home and continuously took care of older adults with stroke until the date of data collection; 2) aged at least 18 years old; 3) had no cognitive impairment (in case family caregivers who aged 60 years or older) investigated by Mini Mental State Examination Vietnamese version; and 4) was able to speak and understand Vietnamese.

Instruments Data were collected using 7 questionnaires as following:

The Demographic Questionnaire

The Demographic Questionnaire was elaborated by the researchers, including age, gender, marital status, religion, relationship with stroke patient, occupation, the number of people living in the same household**,** monthly income of a family, duration of being a caregiver and time per day for taking care of patient.

The Barthel Activities of Daily Living Index (BADLI)

The BADLI was first developed by Mahoney and Barthel (1965) and the modified version of Wade and Collin (1988) was used to measure patient's activities of daily living [ADLs]. It measures the body functions which include bowel, bladder, grooming, toilet use, feeding, transfer, mobility, dressing, stairs, and bathing. The total scores range from 0 to 20, with higher scores indicating more independent ADLs. The scores of 0-4 indicate "very severely dependence", 5-9 "severely dependence", 10-14 "moderately dependence", 15-19 "minor dependence", and 20 indicating "independence. The Cronbach's alpha was .99 among 459 stroke patients in a Middle Eastern country (Oveisgharan et al., 2006). In this study, its internal reliability was .92.

The Zarit Burden Interview (ZBI)

The ZBI was used to measure family caregiver burden. It was developed by Zarit, Reever, and Bach-Peterson (1980). It consists of 22 items and measures the existence of objective and subjective caregiver burden including caregiver's health, psychological well-being, social life, finance, and the relationship between caregiver and care receiver. Each item is assessed on a 5-point Likert scale ranging from 0 to 4 (0 = never, 1 = rarely, 2 = sometimes, 3 = quite frequently, and 4 = always). The scores were calculated by summing all items and ranged from 0 to 88. The scores of 0-20 indicate "little or no burden", 21-40 "mild to moderate burden", 41-60 "moderate to severe burden", and 61-88 indicating"severe burden". The ZBI has been shown to be a valid and reliable instrument with Cronbach's alpha ≥ .82 (Jaracz et al., 2014; Truong, 2015). In this study, the Cronbach's alpha of internal reliability was .90.

The Knowledge of Stroke Caregiving (KSC)

The KSC of Im-Ote (2008) was used for assessing knowledge of family caregiver in caring for stroke survivor. It consists of 23 items which cover 4 components of care tasks for stroke patients. The components included knowledge about stroke (6 items), ADLs care (7 items), safety and complication prevention (7 items), and psychosocial care (5 items). The answer for each item is yes, no, and don't know. The correct answer gets 1 score and incorrect answer gets 0. Total score of KSC was 23. The higher score represents the higher knowledge. This instrument had its reliability of .86 (Im-Ote, 2008). In this study, its internal reliability using Kuder-Richardson 20 was .81.

The Self-Rated Health Questionnaire (SRHQ)

The SRHQ of Mossey and Shapiro (1982) was used in this study. It is one item question asking the caregiver of older adult with stroke to self-rate his/her current health status. The answer ranges from excellent (4 scores), good (3 scores), fair (2 scores), and poor (1 score). Thus, the higher scores indicate the better perceived health status. The coefficient of stability of test-retest reliability of this instrument was 1.0 (Suthamtewagul, 2015). In this study, its coefficient of stability was .97.

The Relationship between Caregiver and Stroke Patient Questionnaire (RCSPQ)

The RCSPQ of Tirapaiwong (1997) was used to assess the relationship between family caregiver and older adult with stroke. This instrument was translated and adapted from the Intimacy Scale (Walker & Thompson, 1983) by Tirapaiwong (1997). It was assessed feeling of family caregivers towards older adults with stroke about love, unselfishness, satisfaction, honesty, respectfulness, acceptation of each other's opinion, attachment, and feeling instability of

relationships. It includes 17 items of 6 rating scales ranging from not at all (0 score), very little (1 score), sometimes (2 scores), often (3 scores), almost all the time (4 scores), and all the time (5 scores). The RCSPQ has excellent internal consistency with Cronbach's alpha that range from .91 to .97 (Walker & Thompson, 1983). In this study, the Cronbach's alpha was .97.

The Social Support Scale (SSS)

The SSS of Im-Ote (2008) was used to assess social support of family caregivers of older adults with stroke. This instrument was developed based on social support concept of House (1981). The SSS consists of 4 components of 18 items including emotional (5 items), information (3 items), appraisal (5 items), and tangible (5 items) supports. Each item was assessed on a 5-rating scale ranging from 1 to 5 (1= never, 2= little, 3 = moderate, 4 = much, and 5 = the most). The scores were calculated by adding all items, which can range from 18 to 90. The higher scores represent the higher social support the caregiver receives. The SSS of Im-Ote (2008) has its reliability of .76. In this study, the Cronbach's alpha was .94.

Data analyses

Data was computed using the SPSS software. Descriptive statistics was used to describe demographic data. Pearson's product moment correlation coefficient was calculated to examine the correlation between financial status, duration of being a caregiver, relationship between caregiver and stroke patient, knowledge of caregiver about stroke care, patient's ADLs, caregiver's general health perception, duration of being a caregiver, time per day for taking care patient, social support and caregiver burden whereas Spearman's rho correlation test was used to examine the relationship between general health perception and caregiver burden. All assumptions testing for normal distribution of data as well as Pearson product moment correlation coefficient were tested before analyzing the data.

Ethical considerations

This study was approved by the Institutional Review Board, Faculty of Nursing, Burapha University, and Director of Hai Duong Province General Hospital, Vietnam before data collection was conducted.

Results

1. Demographic characteristics

Table 1 Demographic characteristics of family caregivers of older adults with stroke (*n* = 120)

Variable	Frequency	Percentage
Gender		
Female	74	61.7
Male	46	38.3
Age (years) *M*=51.23, *SD*=11.05, *Min*=21, *Max*=69		
21- 29	7	5.8
30- 39	10	8.4
40- 49	26	21.7
50- 59	46	38.3
60- 69	31	25.8
Religion		
Buddhism	76	63.3
No religion	38	31.7
Catholic	6	5.0
Relationship with stroke patient		
Spouse	42	35.0
Daughter	44	36.7
Son	27	22.5
Relative	7	5.8
Marital status		
Single	15	12.5
Married	80	66.7
Divorced/Separated	9	7.5
Widowed	16	13.3
Single	15	12.5
Occupation		
Unemployed	3	2.5
Housewife	23	19.2
Retired	23	19.2

Table 1 (cont.)

Variable	Frequency	Percentage
Farmer	53	44.2
Other	18	15.0
Household member *M*=3.75; *SD*=1.445; *Min*=2; *Max*=9		
2	25	20.8
3- 4	65	54.2
5- 6	25	20.8
7-8	4	3.3
>8	1	.8
Family financial income (VND-Vietnam Dong) *M*=10,950,000 (482USD); *Min*=2,000,000 (88USD); *Max*=28,000,000 (1,232USD)		
1,000,000 (44USD) - 10,000,000 (440USD)	67	55.8
10,000,001(441USD) - 20,000,000 (880USD)	49	40.8
> 20,000,000(>880USD)	4	3.3
Duration of being a caregiver (months) *M* = 9.53; *SD* = 7.14**;** *Min* = 2; *Max* = 51		
1-10	76	63.3
11-20	38	31.7
21-30	4	3.3
31-40	1	.8
>40	1	.8
Time per day for taking care of patient (hours) *M* = 8.11; *SD* = 2.55; *Min* = 4; Max = 16		
1-5	14	11.7
6-10	86	71.7
11-15	19	15.8
16-20	1	0.8

Family caregivers' age ranged from 21 to 69 years with a mean of 51.23 (*SD* = 11.05). Most of them were female (61.7%). The majority of caregivers were married (66.7%), with

Buddhism (63.3%), and lived with an average of three members in the same household. Most of them were farmers accounting for 44.2%. About 36.7% were daughters and 55.8 % reported that their family monthly income was approximately 441 USD. Overall, they have been family caregivers for the duration of 9.53 months (*SD* = 7.14) and spent about 8.11 hours per day (*SD* = 2.55) in taking care of stroke survivors at home.

2. Description of caregiver burden of family caregivers of older adults with stroke

Table 2 The frequency and percentage of total scores of caregiver burden (*n* = 120)

Caregiver burden	Number	Percentage
M= 38.18, *SD*= 14.57, *Range*: 3 - 71		
Little or no burden	15	12.5
Mild to moderate burden	46	38.3
Moderate to severe burden	51	42.5
Severe burden	8	6.7

Overall, the result showed that family caregivers of older adults with stroke had a mild to moderate burden with the mean score of 38.18 (*SD* = 14.57). Among 120 caregivers, 46 caregivers (38.3%) perceived caregiving as mild to moderate burden, 51 caregivers (42.5%) perceived caregiving as moderate to serve burden while 8 caregivers (6.7%) perceived caregiving as a severe burden.

3. Correlations between caregiver burden and selected factors among family caregivers of older adults with stroke

Table 3 Correlations between caregiver burden and selected variables

Variables	Caregiver burden (r/ r_s)	*p*- value
Patient's activities of daily living	-.34**	.01
Knowledge of caregiver	-.31**	.01
Duration of being a caregiver	-.33**(r_s)	.01
Time per day for taking care of patient	.41**(r_s)	.01
Relationship between caregiver and stroke patient	-.43**(r_s)	.01

Table 1 (cont.)

Variables	Caregiver burden (*r*/ r_s)	*p*- value
Financial status	-.46**(r_s)	.01
Caregiver's general health perception	-.31**	.01
Social support	-.51**(r_s)	.01

r = Pearson product-moment correlations, r_s = Spearman rank correlations.

Table 3 revealed that there were moderate and negative relationship between patient's activities of daily living, knowledge of caregiver, duration of being a caregiver, relationship between caregiver and stroke patient, financial status, caregiver's general health perception, and caregiver burden (r= -.34, r= -.31, r_s= -.33, r_s= -.43, r_s = .46, r= -.31, $p < .01$, respectively). The relationship between time per day for taking care of patient and caregiver burden was positively moderate (r_s = .41, $p < .01$). Whereas the relationship between social support and caregiver burden was slightly high and negative (r_s= -.51, $p < .01$).

Discussion

The burden among family caregivers of older adults with stroke. Overall, family caregivers of older adults with stroke felt a mild to moderate level of caregiving burden. The finding was consistent with some previous studies. For instance, Yeh and Chang (2014) stated that Taiwanese caregivers had a mild level of caregiving burden. While, Kumar, Kaur, and Reddemma (2015) showed that the mean score of Indian stroke caregiver burden was considered as mild to moderate burden.

In this study, family caregivers provided care to older adults with stroke who had a moderate dependence. It meant that the stroke patients could partially perform their daily and family caregivers needed to support some helps of ADLs for them such as helping them for feeding, bathing, grooming, and dressing. Moreover, these caregivers must help them in managing bowel, bladder, and toilet use too. These tasks may lead caregivers in this study to perceive mild to modeare burden. Based on Lazarus and Folkman (1984), providing care for these patients could make caregivers being stressful, and can lead to burden. Furthermore, caregivers reported that the average their family's monthly income was approximately 482 USD for families consisting of four members on average. Due to the under average monthly income according to General Statistics Office of Vietnam (2012), it may create some difficulties for family caregivers to spend for medicine, rehabilitation, and demands for providing care for stroke patients which lead them to perceive caregiving burden (Gbiri et al., 2015). All of

these could significantly contribute in mild to moderate burden of family caregivers of older adults with stroke in Hai Duong, Vietnam. Another reason could be linked to knowledge of caregivers. This was because caregivers had a moderate knowledge on caregiving with mean score of knowledge of caregiver of 14.04 of 20. They were provided information about stroke management and knowledge of stroke care at home by health professions when they took stroke patients to the hospital. These may help them to actively apply for providing care for and managing stroke patients at home and it may facilitate caring stroke patients with less problem. Moreover, caregiving burden can be explained by duration of being caregiver that they provided care of stroke patients. In this study, they have provided care for their relatives for a period of 9.53 months. They have experienced long time of caregiving, accepting and became more familiar with their caregiving role, thus, they could provide care with little problem. As a result, a moderate knowledge of caregiver and long duration of being a caregiver helped caregivers reduced perceived caregiver burden.

Besides those, caregiving burden can be explained in the context of Vietnamese culture that parents and older adults who are respectful and usually are looked after at home, especially when they are sick, either by family members, such as spouse or their children (Truong, 2015). This is a strong believe on gratitude system in eastern countries (Jullamate, de Azeredo, Rosenberg, Paul, & Subgranon**,** 2007) including Vietnam. In this study, about 94.2% of caregivers were spouses, daughters or sons. Family caregivers may get some supports from other family members for providing care because they had a closed relationship with older adults and provided care for them. This would facilitate for care for older adults with stroke at home with lesser problem. Additionally, the majority of caregivers in this study were female and it may easier for them to accept the caregiving role (Costa, Costa, Martins, Fernandes, & Brito, 2015). Moreover, 82.6% of caregivers were farmers, housewives, and people who have retired from their jobs. It may be easier for them to adjust to the caregiver's schedule to provide care for stroke patients. As a result, all of reasons mentioned above may facilitate caring stroke patients with little problem.

Factors related to burden among family caregivers of older adults with stroke

There were a moderate and negative correlation between patient's ADLs and caregiver burden. In this study, the caregivers took care of older adults with stroke who had ADLs dependence at a moderate level. It showed that stroke patients with ADLS dependence had limitations regarding abilities to perform their daily activities on their own. Thus, family caregivers need to provide support to them which creating caregiving tasks. Increasing caregiving

tasks may make caregiver more stressful and this contributed to increase caregiver burden among stroke caregivers. Family caregivers took care of stroke patients who had high patient's ADL score, they could have lesser caregiving tasks, thus, this may lead them to perceive lesser burden. This finding was consistent with previous study (Costa et al., 2015). Additionally**,** the study of Yeh and Chang (2014) stated that the level of care receivers's ADL had an impact on family caregivers's schedules as well as an impact on family caregivers's health status, thus, patient's ADL was negatively related to caregiver burden.

Knowledge of caregiver had moderate negative correlation with caregiver burden. In this study, family caregiver had some knowledge about stroke, daily care, safety and preventing complications of stroke, and psychosocial care with the mean total score of knowledge of caregiver at 14.04 of 20. They could apply their knowledge partly in providing care for stroke patients. Thus, they could experience a little problem during taking care of stroke patients at home, and this may reduce their level of perceived burden. This is consistent with the study of Yeh and Chang (2014). In addition, the perceived caregiver burden may be greater due to the lack of knowledge about available resources and inability to cope with stress effectively (Karahan et al., 2014).

There was a negative relationship between duration of being a caregiver and caregiver burden. In this study, the family caregivers have been family caregiver for 9.53 months on average. Thus, they gained experience in providing care for stroke patients and accepting their role as family caregivers, and became more familiar with their role of caregiving. They provided care and managed stroke patients at home. Therefore, they may experience less stressful during taking care of stroke patients. As a result, family caregivers who had long duration of being caregiver, their level of perceived burden was reduced. This finding was consistent with finding from the study of Zainuddi et al. (2003). They studied 52 caregivers of older people found that caregiving burden was associated with duration of being a caregiver, and in case of family caregivers had a lower duration as a role of caregiver, they faced more difficulties in taking care of patients due of lack of prior experience in providing care, and led them to higher perceived burden.

Regarding the time per day for taking care of older adults with stroke, the results showed that daily hours of caregiving was positively moderate related to burden. In this study, the family caregivers spent about 8.11 hours per day in taking care of the patients. It reduced family caregivers' personal time for themselves and led them to perceive caregiver burden. Family caregivers who provided less hours of care for providing care, they may have more time for themselves and reduce their perceived burden. This finding was consistent

with previous study (Gbiri et al., 2015). Moreover, according to Brinda, Rajkumar, Enemark., Attermann, and Jacob (2014), increasing the time spent on supervision and helping ADLs for relatives with disabilities increased caregivers' burden significantly.

There was negatively moderate correlation between caregiver burden and relationship between stroke patient and caregiver. In this study, family caregivers expressed a good relationship with older adults with stroke. A good relationship may lead family caregivers to try to do the best on their abilities in providing care and continue providing care with little problem. As a result, good relationship between caregiver and older adult with stroke may reduce caregiver's perceive burden. This finding was consistent with previous studies (Gbiri et al., 2015; Yeh & Chang, 2014). In addition, the study by Vellone et al. (2011) showed that providing care may be a chance for caregivers to express of love and concerns with care-receiver and made close connections between caregiver and care-receiver. This may lead caregivers to reduce burden when they have closer relationship.

In this study, financial status was negatively related to burden of caregivers. The caregiver's family had a low monthly income which the average income was approximately 500 USD per month. Low monthly income may lead to limitations in expenses for medicine, physiotherapy for stroke recovery, demands for providing care for stroke patients, and demands for caregiver's ADLs. Thus, low family income could lead family caregivers to experience burden. The family caregivers' who had a higher monthly income could arrange medication and facilities for providing better care, thus, they experienced lesser caregiver burden. This finding was consistent with previous study (Gbiri et al., 2015). They found that the financial status was an important factor that could predict caregiver burden.

For general health perception, the findings of this study indicated that caregiver's general health perception was negatively related to caregiver burden. With regard to this result, family caregivers of older adults with stroke did not have good general health perception with the mean score of 2.28, it may make them more stressful and lead them to perceive burden. This was because the task of taking care may lead caregivers to caregiver's health problems which may affect to their general health perception (Ostwald, Bernal, Cron, & Godwin, 2009). This was similar to other studies which found that higher caregiver self-rated health status was associated with the lower burden score (Jeong et al., 2015; Jaracz et al., 2014). Moreover, Ostwald and colleagues (2009) also found that a lower caregiver self-rated health status was a predictor of higher stress while providing care, and this may increase caregiver burden.

Social support reported by family caregiver had a negative relationship with caregiver burden. In this study, the family caregivers received partial emotional, informational, appraisal and tangible support while providing care for stroke patients at home. This may facilitate in providing care for stroke patients at home with lesser problem, and lead them to reduce their perceived burden because they got support for taking care of stroke patients. It was consistent with other study which caregivers who received low social support related to higher caregiver burden (Chiou et al., 2009). Additionally, the study of Ostwald et al. (2009) stated that the availability of emotional and informational support was associated with lower stress levels in caregivers. Moreover, lacking of social support for caregiving from available resources was difficult to cope with caregiving tasks which led them to perceive more burden (Karahan et al., 2014).

Recommendations and further study

1. Strategies to reduce the burden of caregivers of older adults with stroke should focus on the aspects of stroke care, such as enhancing patient's activities of daily living, knowledge of caregiver, relationship between caregiver and stroke patient, and provide social support.

2. Future research should focus on predicting factors of caregiver burden of family caregivers as well as interventions to reduce caregiver burden in this population.

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