Original article

Stress and associated factors of caregivers of elderly medical inpatients at King Chulalongkorn Memorial Hospital

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Background: Parallel with the increasing number for elderlies, the need of care when they were acutely ill has multiplied, with caregivers being tasked from the beginning to the end of the illness. A family member was often a primary person to take care of the elderly. This role might affect their mental health and quality of life.
Objective: To explore the progression of stress and the associated factors among caregivers of the elderlies admitted with acute illness.
Methods: This longitudinal descriptive study examined various factors associated with caregivers of the elderlies who were admitted to the medical wards of King Chulalongkorn Memorial Hospital. The study used structured questionnaires to elicit demographic information of the caregivers and the elderlies, Caregiver Strain Index (CSI), the Thai version of quality of life assessment (SF-36), and activities of daily living assessment (ADL) when the elderlies were admitted. Participated caregivers were then followed at one and three months using the CSI.
Results: One hundred caregivers were enrolled in the study. The majority of caregivers had an level of stress and had a good quality of life. The highest average score of stress was at the baseline (score 4.7). Factors positively related to stress of caregivers were age of caregivers and being a family member of elderly (as opposed to being a professional caregiver) was related to the CSI score. The quality of life was negatively associated with the stress and could predict the decrease of stress in caregivers of elderly patients.
Conclusion: Most caregivers of elderly patients had a good quality of life which was a protective factor in stress of caregivers in elderly patients. Age of caregivers and being a family member could help related parties promote caregivers' mental health.

Keywords: Stress, caregiver, elderly, acute illness.

The number of elderly populations has been growing continuously throughout the world. As they were in a sensitive phase of life due to the deterioration in physical and mental health, the elderly needed more care and support than those in adult age. According to the previous study, more than 40.0% of the elderly had at least one medical problem. About 75.0% of the elderly was suffering from chronic disease.[1] The consequence of these chronic illnesses could lead to an acute episode of illness. Caregivers, person who provide care and support to the elderly, is often a close person or family member. The task often began before and ended after the illness episode. Caregivers' responsibility was complex, so they need an adequate preparation for this role such as costs and times. Some of them needed to spend long hours caring for older adults and had less times for taking care of themselves.

The caregiving role could cause a significant stress in a caregiver. Caregivers were stressful resulting in the decrease in their quality of life. Also, various factors could be associated with the course of stress. According to the literature review, there was no current study about the progression of stress and associated factors of caregivers of elderly admitted

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Received: June 30, 2020
Revised: August 17, 2020
Accepted: October 16, 2020

in the hospital with acute illnesses. The caregiver mean the person who is primarily responsible for assisting the elderly. Therefore, this study aimed to examine the prevalence of stress in caregivers, the progression of the stress and the factors associated with the stress among caregivers of the acutely ill elderly. In order to help promote the importance of caregivers of the elderly's mental health.

Materials and methods

In this predictive study, caregivers of the elderly admitted in medical wards of King Chulalongkorn Memorial Hospital with acute illnesses and fulfilled the selection criteria were recruited. Subjects were the main caregivers of elderly patients who aged from 60 years and admitted in hospital at least 3 days at one of the three medical wards. The subjects must be at least 18 years old and willing to participate in this study. The caregivers of re-admitted patients and the transferred cases from other wards were not included in this study. Sample size was calculated from the expected prevalence of caregivers being stress (62.0%)[2], at alpha level of 5.0% and error level of 0.1. The calculated sample size was 90.5, thus 100 subjects were expected to this study after adjusting for 10.0% attribution rate.

All subjects were invited to provide information using the following questionnaires: 1) a demographic questionnaire; 2) Caregiver Strain Index (CSI) Thai version developed by Sasat S. (Cronbach's $\alpha = 0.86$).[3] The score less than 7 reflected normal stress level; and, 3) Quality of life assessment (SF-36) Thai version developed by Leurmarnkul W. (Cronbach's $\alpha = 0.87$).[4] The score more than 50 reflected a good quality of life. At the period of one and three months after the first data collection, the researcher did follow-up interview with subjects by using the CSI via telephone.

The ethical and trust sponsorship has been approved in 2019 by the Ethics Committee of the Faculty of Medicine, Chulalongkorn University (IRB no. 316/62).

Statistical analysis

The statistical analysis was conducted using the SPSS version 22.0. The descriptive statistics was used to describe the characteristics of the subjects and the caring elderly patients such as percentage, mean, and standard deviation (SD). Chi-square and Fisher' s exact were used to test the difference among factors related to stress of caregivers of elderly. Multiple liner regression was used to examine association the relationship between stress and factors related to it. $P < 0.05$ was considered as statistically significant difference.

Results

A total of 100 subjects in this study and completed baseline and two follow-up assessments. Demographic information of subjects was as followed. Sixty-five percent were female. The average age of the caregiver subjects was 50 years; 28.0% of the subjects were less than 40 years old. Concerning the marital status, 48.0% were married, while 42.0% were single. Half of the subjects had no child. Most of subjects, 49.0% had Bachelor's degree or higher. About the occupation, 23.0% were contractor and 19.0% were civil servant. In addition, 43.0% had sufficient income and enough for saving, while 39.0% had sufficient income but not for saving. Regarding medical problem, 70.0% had no physical problem and 92.0% had no mental health problem. As for caregiving status, 75.0% were member in family such as father, mother, or child. Among them, 48.0% had been giving care for more than 3 years and 84.0% spent more than 12 hours per day as a caregiver. Most of them, 72.0% felt that they had received sufficient information from medical team.

Regarding the demographic data of elderly patients, 34.0% of them aged between 71 - 80 years, 31.0% aged between 81 - 90 years. Among them, 32.0% had respiratory disease, 42.0% had the civil servant medical benefit and the universal coverage, 92.0% were in the normal level of the severity of the disease (SOS score assessment), and 42.0% were unable to perform the daily activity by themselves.

The stress of caregivers was generally within normal range. In the baseline assessment, the average score was 4.7 (SD = 3.0). Twenty-nine subjects were in the high level of stress. In the second assessment, a month later, the average score was 4.4 (SD = 3.2) with 25 subjects in the high level of stress. In the third assessment, three months after the first assessment, the average score was 4.6 (SD = 3.3) with 26 subjects in the high level of stress. According to three times assessments, the result showed that the most prevalent stress was the first time of assessment with the highest average score of stress. However, paired *t* - test of the three assessments showed no statistical difference between the baseline and follow-ups (Table 1).

Table 1. The number and percentage of stress level among subjects.

Time	Mean	SD	Min	Max	Level of stress	
					Higher than normal (n) (score ≥ 7)	normal (n) (score < 7)
1st	4.7	3.0	1	12	29	71
2nd	4.4	3.2	0	13	25	75
3rd	4.6	3.3	0	13	26	74

The quality of life assessed by SF-36 could be viewed into 8 aspects: physical functioning had an average score of 63.6 (SD = 19.7); role-physical had an average score of 62.3 (SD = 39.7); bodily pain had an average score of 72.1 (SD = 20.9); general health had an average score of 62.3 (SD = 17.0); vitality had an average score of 62.6 (SD = 18.2); social functioning had an average score of 71.6 (SD = 24.2); role-emotional had an average score of 63.3 (SD = 41.4); and mental health had an average score of 69.0 (SD = 20.2).

Factors related to the stress of caregivers of elderly patients

Among the various demographic factors, only the proportion of relationship between caregivers and elderly patients were different among those caregivers who have and did not have high stress. Other factors were found not related to stress of caregivers. After examining the association among physical factor of caregivers, stress of elderly patients, and the score of ADL, the result showed that there was no correlation between these factors and stress in caregivers (Table 2).

Table 2. The association between general information and stress of caregivers of elderly patients.

Personal factors of caregivers	Level of stress				Statistics	*P*-value
	Normal		Higher than normal			
	n	%	n	%		
Gender						
Female	43	67.2	21	32.8	X^2	0.263
Male	28	77.8	8	22.2	1.255	
Age (year)						
Not over 40	16	57.1	12	42.9	X^2	0.061
41 – 50	19	67.9	9	32.1		
51 – 60	15	71.4	6	28.6	7.353	
Over than 60	21	91.3	2	8.7		
Marital status						
Single/divorce/widow/seperate	36	69.2	16	30.8	X^2	0.685
Married	35	72.9	13	27.1	0.165	
Number of child (n)						
No children	13	61.9	8	38.1	X^2	0.301
Had children	58	73.4	21	26.6	1.068	
Educational level						
No formal education	2	66.7	1	33.3	Fisher' s	0.320
Primary school to vocational degree	25	80.6	6	19.4	exact	
Bachelor degree or higher	44	66.7	22	33.3	2.030	
Occupation						
Unemployed	11	64.7	6	35.3	X^2	0.882
Civil servant	13	68.4	6	31.6		
Employee	12	70.6	5	29.4	0.664	
Contractor/freelance/marchandise/others	35	74.5	12	25.5		

Table 2. (Con) The association between general information and stress of caregivers of elderly patients.

Personal factors of caregivers	Level of stress				Statistics	*P*-value
	Normal		Higher than normal			
	n	%	n	%		
Sufficiency of income						
Sufficient (enough for saving/not enough for saving)	61	74.4	21	25.6	X^2	0.111
Insufficient (no debt/in debt)	10	55.6	8	44.4	2.543	
Medical problem: physical						
No	47	67.1	23	32.9	X^2	0.194
Yes	24	80.0	6	20.0	1.686	
Medical problem: mental						
No	67	72.8	25	27.2	X^2	0.172
Yes	4	50.0	4	50.0	1.862	
Relationship with elderly patients						
Relatives	22	88.0	3	12.0	X^2	0.031*
Family members (father, mother, child, spouse)	49	65.3	26	34.7	4.679	
Duration of being caregivers (years)						
Less than 1 year	19	67.9	9	32.1	X^2	0.896
1 - 3	17	70.8	7	29.2	0.220	
Over than 3	35	72.9	13	27.1		
Elderly patients care hour per day						
Under 12 hours	11	68.8	5	31.3	X^2	0.829
Over 12 hours	60	71.4	24	28.6	0.047	
Information received from medical team						
Sufficient and understanding/partly understanding	70	71.4	28	28.6	X^2	0.509
Insufficient/no information received	1	50.0	1	50.0	0.437	

*$P < 0.05$

After submitting to correlation analysis, the stress of caregivers was associated negatively with various aspects of quality of life, including role-physical, bodily pain, general health, vitality, social functioning, role-emotional, and mental health (Table 3).

Associated factors of stress in caregivers

Concerning factors statistical significance related to stress of caregivers of elderly patients at baseline examined by multiple logistic regression, only age of caregivers and being a family member of elderly patients were associated with stress. After using multiple multi-level liner regression analysis, factors founded related to longitudinal stress of caregivers of elderly patient were age of the caregiver, being a family member of elderly patient, and total score of quality of life (SF-36). Furthermore, factors founded negatively related to long-term stress of caregivers of elderly patient were total score of quality of life (coefficient = - 0.088, $P < 0.001$), and age of caregivers (coefficient = - 0.035, $P = 0.061$) (Table 4).

Table 3. The correlation between the quality of life in each part with the stress score of caregivers.

Quality of life	Stress scores	
	r	*P*-value
Physical functioning	-0.069	0.494
Role-physical	-0.285	0.004
Bodily pain	-0.253	0.011
General health	-0.392	<0.001
Vitality	-0.478	<0.001
Social functioning	-0.330	0.001
Role-emotional	-0.300	0.002
Mental health	-0.478	<0.001

Table 4. Prediction of the correlation between stress of caregivers of elderly patients and related factors tested by multilevel multiple linear regression analysis.

Variables	Coefficient (SE)	95% CI	Z	*P* - value
Gender	- 0.411 (0.499)	- 1.390, 0.568	- 0.82	0.410
Age	- 0.035 (0.018)	- 0.071, 0.002	- 1.88	0.061
Marital status				
Single	0 (base)			
Married	- 0.222 (0.521)	- 1.244, 0.800	- 0.43	0.670
Others	- 0.246 (0.825)	- 1.864, 1.371	- 0.30	0.765
Relationship with elderly				
Caregiver	1.394 (1.231)	- 1.018, 3.807	1.13	0.257
Family member	2.099 (0.605)	0.914, 3.284	3.47	0.001
Relatives	0 (base)			
Care hour for elderly per day (hours)	- 0.037 (0.388)	- 0.113, 0.039	- 0.95	0.340
Age of elderly	- 0.010 (0.025)	- 0.059, 0.039	- 0.40	0.686
ADL score of elderly	- 0.025 (0.035)	- 0.058, 0.039	- 0.72	0.469
Total score of quality of life	- 0.088 (0.014)	- 0.115, - 0.061	- 6.34	0.000
Constant = 16.163, calculated R^2 = 0.349, $P < 0.001$				
Estimated variance of between subject variability 4.052 SE 0.722				
Estimated variance of residual 3.000 SE 0.300				

Discussion

Based on the result founded in this study, most caregivers of elderly patients had a normal level of stress in line with the study of Rattanawimol C.[5], that studied about the stress of caregivers of elderly with functional dependence which the results of which showed that the caregivers had a little stress in overall. The current study was also in concordance with the study in the stress in the role of caregivers of elderly in Petchaburi of Kaewraya K.[6] The result of which showed that the caregivers in this study were in the low level of stress. Apart from that, it would be possible that most caregivers participating in the current study had at least Bachelor's degree so that they would be able to deal with their emotion or stress. They tended to understand the situation of the elderly patient as they received sufficient information from medical team. Moreover, most of them had no problem with their income which was considered as a factor related to stress. They, therefore, had no need to worry about their financial problem.

Regarding factors associated with stress of caregivers in elderly patients, age of caregivers and being a family member of elderly patients (father, mother, child, spouse) were related to stress in accordance with the study of Gray R, *et al.*[7], that studied about factors related to stress of caregivers who were a family member of elderly patient by using the stress assessment and ADL assessment. The result from the study showed that factors related to stress were the relationship with elderly such as a caregiver who was married would have the highest stress. In this current study, 75.0% among them were family member of elderly patients. It is known that the gratitude was considered as one of core values in Thailand so that being caregivers for them was an action to be grateful to them. This value was related to the belief of Thai people in karma[8] Furthermore, in the study of Gray R, *et al* [7], who studied factors related to the level of stress of caregivers who was a family member, the result showed that stress was caused by the society or community expectation, multiple roles, and economic factors. Apart from age of caregivers and being a family member of elderly patient, in the current study found the correlation between quality of life and stress of caregivers. A caregiver with a good quality of life tended to be less stressful in line with the study of Pinijsuwan N, *et al.*[9], who studied about the factors predicting the quality of life of caregivers of elderly patients with dementia. The result showed that the quality of life is good.

Concerning predicting factor of caregivers of elderly patients, the result found in the current study that age of caregivers and being a family member of elderly was associated with the stress was consistent with the previous study of Penlap N.[10] which found that age of caregivers were factors related to stress in the caregivers of elderly patient with chronic kidney disease.

As this study was a cross-sectional descriptive study conducting only at King Chulalongkorn Memorial Hospital and the subjects recruited for this study were only the caregivers of elderly admitted with acute illnesses which could not represent the caregivers of elderly with another disease as the result might be different from the current study. Furthermore, there might be some other variables which could be correlated with stress of caregivers to study in the future.

Conclusion

Based on the result of the current study, age of caregivers, being a family member of elderly patients, and the quality of life were associated with stress of caregivers of elderly admitted at King Chulalongkorn Memorial Hospital with acute illnesses. Moreover, the overall score of the quality of life could predict the long-term stress of caregivers of elderly patients. The suggestion for related parties is to help promote mental health of caregivers by giving sufficient information about their role and monitoring carefully their quality of life which could help them to reduce the level of stress.

Conflict of interest

The authors, hereby, declare no conflict of interest.

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