

Cost of Dementia Care in Rural Thai Households

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Objective: The purpose of the present paper was to quantify the cost associated with dementia care in rural Thailand.

Materials and Methods: A cross-sectional study was done on 140 dementia households with caregivers living in rural areas. The activity of daily living (ADL) and the instrumental activity of daily living (IADL), Resource Utilization in Dementia (RUD, Thai version) were used. The socioeconomic status of people with dementia, their families and their caregivers was collected. The hospital utilization data of people with dementia was obtained from the community and the sub-district health promoting hospitals. In terms of indirect costs, the replacement cost approach was employed.

Results: Most of the people with dementia were at low-income levels. The majority of dementia care cost was related to the non-medical care cost. The second highest cost was indirect costs or informal care cost, estimated as productivity loss of unpaid caregivers basing on replacement cost concept. The annual costs associated with dementia were estimated to be 90,644 Thai Baht (US\$ 2,629) per person, of which 95% of the costs were associated with non-medical care and included 30% of indirect cost. Lastly, the dependency score was elastic to the total dementia care cost.

Conclusion: Informal care by family members, which normally was more common in low income family, was a major part of the time spent on caring for people with dementia, and accounted for 30% of the total cost of care. Policymakers should explore furthering the policy options of subsidizing rural households based on the dependency level.

Keywords: Cost of dementia care, Caregiving time, Dementia caregiver, Long-term care, Health services utilization

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Dementia is the illness affecting the persons' cognitive functions and behaviors. Currently, there is no effective preventable and curable approaches. The continually increasing population around the world with dementia, in turn, imperils long-term care costs^(1,2). It was stated that "dementia will become a

family disease once someone in the family suffers from dementia"⁽³⁾. Dementia can also widely affect family, society, and the health system as it had a huge economic burden⁽⁴⁾. Dementia's economic burden does not only affect the part of medical care, but it also affects the family members and society⁽⁵⁾. It was also found that caregiving factors are influencing formal health care service usage and expenditures for caring for patients with moderate to severe dementia⁽⁶⁾.

The increasing medical and societal costs present significant policy challenges. The cost of illness study is crucial as it reminds society and policymakers to be aware of the disease, to recognize the economic burden, and to cope with services allocation^(5,7). Many pieces of research reveal that non-medical care cost was one of the major types of costs of essential dementia care⁽⁸⁻¹²⁾. Many studies have estimated the costs of formal and informal care for patients with dementia. The World Alzheimer's Report 2010

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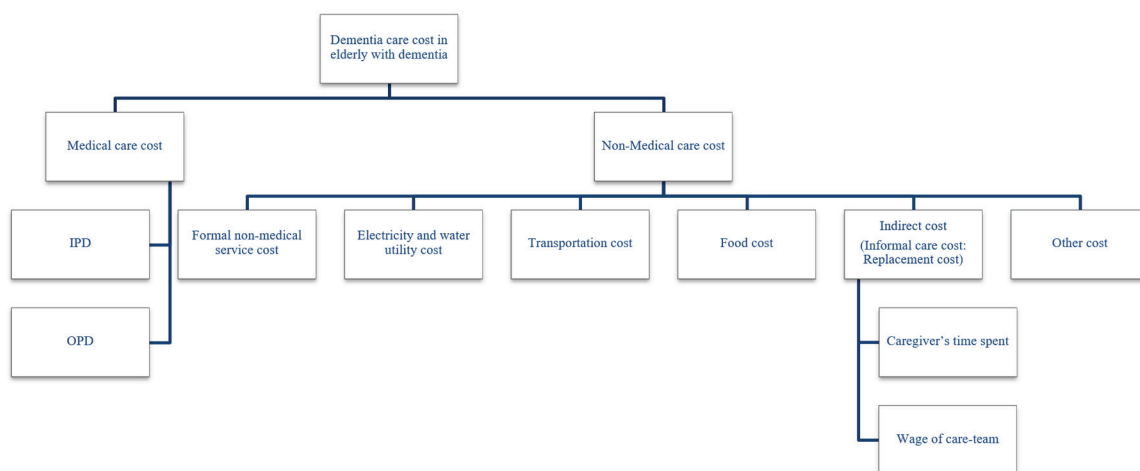


Figure 1. Cost components of dementia care.

presented results of the cost-of-illness of dementia from many countries. The annual cost of dementia was around US\$ 868 million (30.3 billion Thai Baht) in low-income countries, US\$ 3.109 billion (108.4 billion Thai Baht) in lower-middle-income countries, US\$ 6.827 billion (238.0 billion Thai Baht) in upper-middle-income countries, and around US\$ 32.865 billion (1.15 trillion Thai Baht) in high-income countries⁽⁵⁾. Dementia has shown to be an enormous cost and affected the health and social care systems all over the world⁽⁵⁾.

In Thailand, according to Jitapunkul et al⁽¹³⁾, the prevalence of dementia averaged 3.4%, 95% confidence interval (CI) (ranged between 2.8% and 4.0%). Age, writing literacy, and geographical area were the three factors affecting the number of cases of dementia. Thai dementia caregivers needed various bits of help such as information, respite care services, assistance according to dementia elderly's dependency level, and financial supports⁽¹⁴⁾. Additionally, Thailand has been challenged by rapid urbanization, micro-family, declined birth rate, increased aging population, and socio-economic changes. These issues raise the long-term care challenge in Thailand to figure out the sufficiency of health and social services with limited resources⁽¹⁵⁾. The policy directions for dementia in Thailand are still amalgamated with the other diseases under the long-term care system⁽¹⁶⁾ despite the uniqueness of disease patterns and the burden of care⁽¹⁷⁾. The long-term care policy in Thailand emerged in the First National Plan for Elderly People (1982 to 2002) under the five-year National Economic and Social Development Plan⁽¹⁶⁾. For the quality of life of the elderly with dementia, patients who lived in the

community had higher scores in quality of life than the persons living in institutions⁽¹⁸⁾. Although, Thailand was praised to be the best-supporting community and household to the elderly with dementia⁽¹⁹⁾, yet, there were no clear government supports to that particular community or household as Thailand still lacks useful information for promoting health and social protection such as financial, activity, and time needed for providing care.

The information on the economic burden of dementia, especially in Thailand, is limited. To the best of the authors' knowledge, there have been no studies addressing the medical and non-medical cost of dementia care in Thailand. The present study aimed to provide significant data to policymakers to plan dementia policy directions in Thailand. The information on non-medical cost and indirect cost will help understand the burden of dementia to the patients themselves, their families, or even society. The cost data will be fundamental information for economic evaluation study in the future. The present research study aimed at estimating the economic burden of dementia care including medical and non-medical care.

Materials and Methods

The present study focused on the time spent on dementia care and the cost of dementia care from a societal perspective. Medical and non-medical care costs were investigated. The medical care costs included both outpatient and inpatient costs. The non-medical care cost covered formal non-medical service cost, material, nutrition, electricity, and water bill cost, transportation cost, and indirect cost (Figure 1)^(5,8).

The indirect cost was calculated by using the replacement method^(20,21). Secondary data from community and sub-district health promoting hospitals were used to reflect medical care costs. Primary data collection was employed to capture other non-medical care costs and indirect costs, by interviewing dementia caregivers using the Resource Utilization in Dementia (RUD)^(22,23) Thai version⁽²⁴⁾ and the sociodemographic questionnaires.

Participants

The present study identified three provinces in Thailand as the study site based on previous participation in the dementia comprehensive care project in Thailand⁽²⁵⁾. The inclusion criteria were the dementia patients aged 60 and above, suffering from dementia, diagnosed by general physicians, and assessed degree of severity by the health professionals such as registered nurses, or public health officers. There were 50 patients on the list in Banfang (northeast province), 70 in Lamsonthi (central), and 60 in Khiri-Rat Nikhom (south). However, 9 households in Banfang, 17 in Lamsonthi, and 14 in Khiri-Rat Nikhom were excluded from the study because their caregivers were not available to provide information, giving a response rate of 78%. Details of sample selection can be found in the study by Chuakhamfoo et al⁽²⁶⁾.

The instruments for primary data collection

The RUD: Thai version: The original RUD⁽²³⁾ was translated into the Thai version to be used for primary data collection in the present study. The translated Thai RUD had reached an acceptable level of reliability⁽²⁴⁾. The RUD indicated the time spent on dementia care, healthcare utilization, and related care activities.

Dependency level: ADL/IADL: The activity of daily living and instrumental activity of daily living (ADL/IADL) tool used in the present study comprised 16 items with three Likert scales to assess the capacity to perform individual activities of daily living by a person. This version came from the synthesis of the National Health Commission Office of Thailand on issues 1.1 and 1.2⁽¹⁵⁾ as the standard instrument for assessing the quality of elderly clinics. Two domains in this instrument measured basic and complex activities. The score of 16 to 20 indicated that the subject was less dependent. The score of 21 to 35 indicated that the subject was partially dependent. The score of 36 to 48 indicated that the subject was totally dependent.

Sociodemographic data of elderly with dementia and caregivers: The questionnaire was constructed to ask the dementia caregivers about their characteristics and their patient's characteristics such as age, gender, education, health insurance scheme, dementia care activities, and income.

Cost identification: According to Wimo and Prince⁽⁵⁾, costs were categorized into medical and non-medical care costs. Medical care costs were the costs occurring in the hospital by healthcare professionals that provided dementia care services. Non-medical care costs were provided by other formal professionals such as a social workers and informal caregivers such as a family-caregivers, and laypeople such as drivers. Thus, the non-medical care cost included both formal and informal care, but the medical care cost represented only the formal care cost.

Data collection and cost estimation: The medical care costs on inpatient and outpatient services were collected through electronic medical records retrieved from the HOSxP software⁽²⁷⁾, covering medications, medical consultation, hospital admission, and medical investigations.

The non-medical care costs were assessed by interviewing dementia elderly's caregiver using the RUD instrument. The non-medical care costs covered the actual formal non-medical service cost, electricity and water bill cost, transportation cost, nutrition cost, and other costs. The formal non-medical service cost incurred when the professionals and formal workers provided services in any setting. The approach to calculate the cost of the formal service was the multiplication of time (in hours) of service provided and the hourly wage for each type of professional such as social worker, trained formal caregiver in the community, and counselor.

The annual electricity and water bill costs were calculated from monthly charge and the percentage of usage for dementia care. The transportation cost depended on the type of vehicle the household used. The calculation was concentrated on the fuel consumption (kilometer per liter) of the vehicle multiplied by the price per liter and by the distance. The nutrition cost varied considerable especially in households that provided special nutrition for their dementia elderly. The calculation was based on the actual type of food and its cost using the actual price. Other costs included the consumables for dementia care such as disposable material, dressing material, and diapers. These were calculated by using the approach of prices multiplied by quantities. In case of durable products, the lifetime use of them was used

for calculating depreciation cost.

The indirect cost was computed through the method of replacement cost, by multiplying the number of caregiving hours provided to dementia elderly collected by the RUD instrument with the standard wage of the Lamsonthi's long-term care cost in Thailand⁽²⁸⁾.

Statistical analysis

Descriptive statistics were used to describe the characteristics of dementia households. The Shapiro-Wilk was used to test for the normality of the data. If the data were normally distributed, one-way ANOVA was used for determining significant differences. For non-normally distributed data, the Kruskal-Wallis was adopted to test the differences.

In addition to cost estimation, the cost elasticity of dementia care was investigated. The elasticity was estimated according to Gujarati⁽²⁹⁾ as shown in Equation 1. The present study used the mean value of X and Y for elasticity estimation. The multiple linear regression model was used to derive the effect of selected independent variables (Xs) on dementia cost (Y).

Equation 1: Linear model's elasticity equation

$$\text{Elasticity} = \frac{dy}{dx} \frac{\bar{X}}{\bar{Y}}$$

Ethical approval

The present study protocol was approved by the Ethics Committee of Naresuan University (document number 0251/60). The dementia caregivers signed informed consents for giving interviews. All documents and electronic records were kept in locked storage. All computer files needed password code to open. No names of the participants were mentioned in the transcript.

Results

Characteristics of dementia elderly and caregivers

Most of the caregivers (85 percent) were living with dementia elderly. More than 95% of the caregivers were dementia patients' relatives, where 58.6% were their children, 25.0% their spouse, 13.6% relatives, and 2.9% siblings. According to ADL or IADL scores, 22.9% of dementia elderly were less dependent and 40.7% totally dependent. For dementia severity, 36.4% were mild dementia, 29.3% were moderate dementia, and 34.3% were severe.

Table 1 presents the characteristics of dementia households by dementia severity and region. The households with dementia elderly in the present

study were more in the low-income bracket with an annual average household income of 133,609 Thai Baht (US\$ 4,085). Household income among different severity was not statistically different ($p=0.11$). However, household income were statistically different ($p<0.001$) by region as the households with dementia elderly in the south were found to be the most earned average income, and the households in the central area the least earned average income.

Time spent on formal and informal care

Considering the time spent for dementia care by severity level, the average hours spent for dementia care were statistically different among each stage of severity ($p<0.001$, see Table 1). Regarding the RUD instrument (Thai version), the formal care to dementia elderly had an average of 1.74 hours of service time per month. The informal care, consisting of the support for IADL, ADL, and supervision or surveillance, had an average of 89.8 hours per month (95% CI 75.5 to 104.1). Considering the proportions of caregiving time, 58.6% were spent on the supervision or surveillance, 28.7% spent on supporting for IADL, and 12.7% spent supporting for ADL. In contrast, hours of daycare categorized as formal care was only 0.97 hour per month.

Cost of dementia care

The present study investigated dementia care costs based on the societal perspective. On the overall, it was found that the average costs of dementia care were 90,644 Thai Baht (US\$ 2,629) per patient per year. It was found that indirect costs or cost of time spent by care givers accounted for 30% of total cost and the other non-medical care cost was 65%. The dementia care cost varied by dementia severity, dependency level, household income, and region (see Table 2). Different dementia severity showed the significantly different cost of care ($p<0.001$) as mild dementia had the least cost of care, and severe dementia had the highest average cost of care (112,310 Thai Baht or US\$ 3,257) per year. However, the indirect cost of care was significantly different among different severity ($p<0.001$), moderate dementia was found to be the highest among all the severities. The less dependent dementia elderly had less cost of care in every cost component, except transportation cost and water-bill cost, but this was not significantly different, $p=0.73$ and 0.74 , respectively. Dementia elderly under the universal coverage scheme had a lower cost of care in every cost component. The

Table 1. Characteristics by severity of dementia and region

Characteristics by severity	Total (n=140)	Mild dementia (n=51)	Moderate dementia (n=41)	Severe dementia (n=48)	p-value
Household annual income (Thai Baht)					0.11
Min-max	8,400 to 849,600	15,600 to 488,400	12,000 to 849,600	8,400 to 840,000	
Median	84,000	68,400	84,000	96,000	
• P25	33,600	84,000	32,400	51,000	
• P75	183,000	96,000	188,400	249,600	
ADL/IADL score					<0.001*
Min-max	16 to 48	16 to 38	18 to 43	23 to 48	
Mean (SD)	32.1 (10.2)	23.1 (6.0)	31.4 (7.2)	42.2 (6.0)	
Age of dementia elderly (year)					<0.001*
Min-max	60 to 104	60 to 100	60 to 104	60 to 98	
Mean (SD)	78.9 (9.6)	75.4 (9.7)	78.9 (9.0)	82.5 (8.7)	
Annual service hours provided by caregiver					<0.001*
Min-max	0 to 4,860	0 to 4,860	31 to 4,040	19.1 to 4,725	
Mean (SD)	827 (1,007)	458 (784)	1,067 (1,080)	1,014 (1,059)	
Characteristics by region	Total (n=140)	Central (n=53)	NorthtoEastern (n=41)	Southern (n=46)	p-value
Household annual income (Thai Baht)					<0.001**
Min-max	8,400 to 849,600	8,400 to 660,000	18,000 to 480,000	16,800 to 849,600	
Median	84,000	48,000	72,000	160,800	
• P25	33,600	20,400	33,600	84,000	
• P75	183,000	108,000	127,200	249,600	
Annual service hours provided by caregiver					<0.001*
Min-max	0 to 4,860	0 to 4,725	6.4 to 2,550	24 to 4,860	
Mean (SD)	827 (1,007)	663 (951)	581 (700)	1,235 (1,181)	

ADL/IADL=activity of daily living and instrumental activity of daily living; SD=standard deviation

* One-way ANOVA test, ** Kruskal-Wallis test

richer households significantly spent more on food ($p<0.001$) and other costs ($p<0.001$) than the poorer. Costs of dementia care were significantly different by region as households in the south had the highest cost of care, followed by the north-eastern and the central region, respectively, in every cost component except the IPD cost in a reversed order.

Dementia care cost's elasticity

The multiple regression analysis had shown that annual household income, ADL score, and age of dementia elderly, with a low degree of multicollinearity among these independent variables, were correlated with dementia costs with the coefficients of 2.68, 1,904.43, and 3.21, respectively. The elasticity value was calculated for each coefficient. The authors found only the ADL score to be cost-elastic, that was, a 1% increase in ADL score would cause a 1.26% increase in dementia care cost (see Table 3).

Discussion

The meaning of low-cost of dementia care

The present study reported that the annual total cost of dementia care was US\$ 2,629 (or 90,644 Thai Baht) per person, while in Australia and South Korea were US\$ 12,892, and US\$ 8,676, respectively⁽³⁰⁾. The low cost of dementia care of the universal coverage scheme revealed that they also spent less on material, which might be because the scheme provided enough material or these households had insufficient money to buy consumables as found in richer households.

Unlike other illnesses, the burden of dementia care is associated with the duration of care related to the patient's behaviors and dependency level, impacting on caregiver financially, emotionally, physically, and many other consequences^(31,32). Interestingly, the inpatient cost was found to be highest in the poorest central area. This situation indicated that the hospitals located in the poor area

Table 2. Cost of dementia care by severity and dependency level

Cost of care	Medical care cost (Baht); mean (SD)		Non-medical care cost (Baht); mean (SD)				Total cost (Baht)		
	OPD visits	IPD	Transportation cost	Nutrition cost	Electricity-bill cost	Water-bill cost		Indirect care cost (replacement cost)	Other costs
Annual cost per person	2,994 (5,200)	1,631 (4,375)	612 (2,262)	35,163 (37,338)	7,907 (7,443)	2,075 (2,214)	31,014 (37,770)	20,715 (29,106)	90,644 (73,371)
Dementia severity									
Mild	2,894 (5,451)	736 (2,078)	888 (3,410)	28,849 (28,451)	6,989 (5,248)	1,973 (1,894)	17,192 (29,399)	10,548 (18,021)	60,184 (62,059)
Moderate	3,093 (5,862)	1,714 (4,466)	298 (485)	40,628 (49,863)	8,254 (8,209)	2,034 (2,737)	40,002 (40,488)	19,308 (22,209)	103,167 (78,448)
Severe	3,017 (4,369)	2,510 (5,778)	588 (1,546)	37,205 (32,748)	8,587 (8,700)	2,219 (2,065)	38,022 (39,705)	32,717 (38,460)	112,310 (70,449)
p-value	0.60	0.16	0.92	0.21	0.82	0.56	<0.001*	<0.001*	<0.001*
Dependency level									
Less dependent	3,007 (6,406)	700 (1,454)	571 (1,024)	23,644 (21,650)	6,421 (4,456)	2,164 (2,317)	15,327 (20,439)	12,412 (19,791)	54,408 (48,449)
Partial	3,158 (5,580)	1,549 (4,329)	759 (3,355)	39,344 (47,801)	8,307 (7,871)	2,085 (2,563)	34,330 (40,378)	15,021 (20,519)	92,657 (81,949)
Total dependent	2,841 (4,068)	2,227 (5,362)	504 (1,426)	37,890 (32,583)	8,384 (8,341)	2,016 (1,821)	36,853 (40,849)	30,470 (36,664)	109,185 (70,446)
p-value	0.99	0.28	0.73	0.06	0.48	0.74	<0.001*	<0.001*	<0.001*
Patients' health coverage									
Universal coverage	2,501 (4,268)	1,416 (4,066)	474 (1,157)	34,365 (38,283)	7,347 (6,657)	1,963 (2,134)	30,933 (36,058)	16,630 (21,050)	85,183 (66,493)
Others	5,793 (8,413)	2,848 (5,804)	1,393 (5,187)	39,687 (31,893)	11,083 (10,540)	2,710 (2,588)	31,471 (47,3645)	43,859 (51,100)	121,586 (100,723)
p-value	0.11	0.35	0.26	0.23	0.08	0.25	0.40	<0.001*	0.02*
Annual household income									
Up to 180,000 Baht	2,637 (5,031)	1,461 (4,225)	712 (2,586)	28,171 (25,687)	7,161 (6,669)	1,962 (2,244)	27,900 (35,286)	15,4890 (20,908)	75,023 (59,766)
180,001 to 599,999 Baht	4,377 (5,778)	2,304 (5,021)	288 (557)	51,343 (41,922)	10,219 (9,457)	2,483 (2,159)	35,512 (37,404)	37,156 (43,905)	128,574 (80,073)
600,000 Baht and higher	751 (674)	404 (700)	572 (924)	107,310 (144,158)	9,371 (5,773)	1,667 (1,717)	92,047 (79,340)	28,200 (20,637)	232,767 (151,29)
p-value	0.45	0.88	0.94	<0.001*	0.04*	0.45	0.08	<0.001*	<0.001*
Region									
Central	2,172 (2,393)	2,112 (5,388)	441 (839)	16,169 (16,523)	6,224 (5,202)	1,576 (1,373)	24,850 (35,664)	7,922 (12,882)	51,611 (46,059)
North-Eastern	2,965 (5,650)	1,494 (3,747)	606 (1,682)	36,440 (35,719)	8,129 (8,020)	2,907 (2,838)	21,806 (26,258)	17,278 (21,568)	79,190 (48,507)
Southern	3,969 (6,838)	1,198 (3,553)	815 (3,521)	55,910 (44,615)	9,649 (8,729)	1,908 (2,201)	46,322 (44,298)	38,517 (38,524)	145,825 (84,017)
p-value	0.45	0.17	0.16	<0.001*	0.07	0.04*	<0.001*	<0.001*	<0.001*

SD=standard deviation

* p<0.05 is statistical significance

Table 3. Multiple regression of dementia care cost and cost elasticity

Factors related to dementia care cost (n=140)	Min-max	Median	Mean (SD)	95% CI	Regression coefficient	Cost elasticity
Annual household income (Thai Baht)	700 to 70,800	7,000	11,134 (12,425)	9,058 to 13,210	2.68*	0.46*
ADL/IADL score	16 to 48	32.5	32 (10)	31 to 33	1,904.4*	1.26*
Age of elderly with dementia	60 to 104	79	79 (10)	77.2 to 80.5	3.21	0.006
Cost of dementia care (Thai Baht)	6,716 to 393,622	65,001	90,644 (73,371)	381,362 to 405,882	d	d

ADL/IADL=activity of daily living and instrumental activity of daily living; d=dependent variable; SD=standard deviation; CI=confidence interval

* p<0.05 is statistical significance

had to take responsibility for the cost of dementia care more than the richer areas and the caregivers experienced hospitalization as one of the options for their respite care⁽²⁶⁾.

The methodology of opportunity cost versus replacement cost

Firstly, according to the characteristics of the caregivers focusing on their age and education, the mean age of caregivers both male and female was 53 years old with under middle school education. The opportunity cost approach would give lower indirect cost⁽³³⁾ than the replacement cost reflecting the unreal burden of the cost of care if caregivers needed to be hired.

Secondly, in the context of rural areas, the people who were caregivers worked in agriculture living near dementia households, or some did not work as they reached retirement age. The opportunity cost approach would lead to an underestimation of dementia care costs.

Community-based long-term care as an initiator of dementia care policy

The present study selected study sites based on their best dementia practices implementing the dementia care comprehensive project⁽²⁵⁾. This community-based dementia care was launched under the broader community long-term care policy to deal with the rising elderly population in Thailand⁽³⁴⁾. The informal care in the household might be the principal care for the elderly, while formal care is a support unit⁽³⁵⁾. Most people with dementia globally do live at home and are cared for by family members. Moreover, the family member should be defined in the broadest sense, meaning relatives, neighbors, and friends. These family members are responsible for over 80% of the long-term care of people with dementia⁽³⁶⁾.

Should food costs be counted as dementia care costs?

Table 2 indicates that the nutrition cost accounted

for about one-third of the total dementia care cost. The nutrition cost was significantly different among different household income and study site. The households with the capacity to buy special nutrition for dementia elderly had the additional cost of dementia care. It is interesting to note that different levels of dependency or dementia severity did not differ in nutrition cost (p=0.06 and 0.21, respectively). A point to consider is that the higher earned households might spend more on unnecessary nutrition. On the other hand, the lower earned households might lack the capacity to provide suitable food for dementia elderly. Moreover, nutrition cost did not differ among different dependency levels (p=0.06). However, lack of nutritious food can lead to malnutrition in dementia elderly and increase the chances of worsening physical health^(37,38). Food coupon from the social services unit should be considered for this gap. In-kind food coupon benefit can be one of the social protection policies that the government can give to needy people⁽³⁹⁻⁴²⁾. The nutritionist can be another professional to give appropriate nutrition service^(43,44) to the elderly who suffers from dementia.

The implication of elasticity analysis

As dementia care cost is inelastic to income but elastic to ADL or IADL score (a 1% increase in ADL or IADL score caused a 1.26% increase in dementia care cost, see Table 3), the policymakers should consider how to subsidize the dementia cases. The dependency level was one of the major factors for considering in-cash subsidy⁽⁴⁵⁻⁴⁸⁾.

Formal care and long-term care in Thailand

Table 2 shows that the highest indirect cost of care was found in moderate dementia severity because of the high prevalence of behavior problems (psychotic symptoms) in moderate dementia⁽⁴⁹⁾. Therefore, the caregiver has to spend more time in this stage of severity providing informal service care. The formal care can relieve the informal care burden

especially informal care in the community. The long-term care policy in Thailand is less dependent on the public institutional care⁽⁵⁰⁾ as health professionals at sub-district health promoting hospitals only provide daycare and community hospitals only provide hospitalization. The caregivers live with their dementia elderly every day thus the number of hours of everyday informal care was far more than the number of hours of formal care provided by health professionals.

Limitation

The present cost study was based on the dementia care comprehensive project⁽²⁵⁾. The care program for dementia care in each community and household is the best solution according to the rural contexts, thus, the cost of dementia care cannot reflect the cost of care in other contexts. Secondly, the diagnosis of dementia severity was done by specialist physicians, including general physicians, registered nurses, and psychologists based on their profession criteria.

Further study

The incremental cost of dementia care as compared with normal aging in Thailand is an interesting issue for further study. Dementia care cost is likely to differ from other non-communicable diseases. Therefore, the design of benefits package including the long-term care policy should be considered, along with the payment approaches for dementia care in both health and non-health sectors as the cost of dementia care are increasing.

Conclusion

The present study found that informal caregivers provided the most time spent on dementia care. The annual average cost of care was 90,644 Thai Baht (US\$ 2,629) per person. Because the non-medical care costs accounted for 95% of the total cost in the rural context, it should be a major policy concern. Nutrition cost took one-third of the cost followed by indirect cost. The dependency level of patients and the capacity to pay off household should be the concern of government policy through subsidization as they are sensitive factors to the cost of dementia care.

What is already known on this topic?

Thailand has an increasing number of people with dementia as the elderly populations increase.

What this study adds?

Cost of dementia care is mostly related to

informal direct non-medical care and indirect cost and is inelastic to income but elastic to dependency score.

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Conflicts of interest

The authors declare no conflict of interest.

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