

Role Of Socioeconomics, Psychological State, and Attitude Toward Care Giving on Quality of Life of Dependent Patients' Caregivers in the Northeast of Thailand



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Abstract:

Background: Caring for patients with dependency is a burden on primary caregivers, which impacts them economically, socially, and psychologically. The perception of caregiving and the psychological state associated with it further contribute to these effects.

Objectives: This cross-sectional analytical study aimed to study the socioeconomic and caregiving burden factors associated with the Quality of Life (QOL) of dependent patients' caregivers in the Northeastern region of Thailand.

Methodology: A total of 1,335 dependent patients' caregivers aged 18-59 years in the Northeastern Region of Thailand were selected by multistage random sampling to respond to a self-administered structured questionnaire. The Generalized Linear Mixed Model (GLMM) was performed to identify socioeconomic and caregiving burden factors associated with QOL while controlling the effects of covariates, presenting Adjusted Odds Ratio (AOR) and 95% Confidence Intervals (CI).

Results: Among 1,335 dependent patients' caregivers, more than half of them had poor QOL (58.05%; 95% CI: 39.28 - 44.65). Factors associated with poor QOL were age 46-59 years (AOR=4.30; 95% CI: 2.84-6.51, p-value<0.001), insufficient financial status with debt (AOR=5.89; 95% CI: 3.85-9.01, p-value<0.001), low caregiving knowledge level (AOR=2.43; 95% CI: 1.63-3.64, p-value<0.001), average to low attitude caregiving level (AOR=4.45; 95% CI: 3.30-5.99, p-value <0.001), and having depression (AOR = 3.57; 95% CI: 1.93-6.59, p-value<0.001).

Conclusion: The findings from this study have important implications for healthcare practice and policy—interventions aimed at improving the QOL of caregivers.

Keywords: Quality of life, Dependent patients' caregivers, Long-term care, Perception of caregiving, Confidence intervals, Generalized linear mixed model.

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1. INTRODUCTION

The world is evolving toward a transitional society right now. The most prominent example of this phenomenon has been seen in Thailand, which is anticipated to become "A completely aging society." It has been in the

top 10 Asian countries (Aged Society) since 2000, with 10% of the population being 60 years of age or older. By 2022, this percentage increased to 20% of the total population, and by 2037, it is expected to become a "super-aged society," with 28% of the population being 60

years of age or older. Thailand's population aged sixty and over increased significantly from 2000 onwards. By 2022, twenty percent of the population was in this age bracket. It is expected to transform into a "super-aged society" by 2037, with 28% of its people being 60 years of age or older. The population of Thailand, which is 60 years of age and older, has increased significantly since 2000. The percentage of people in this age range by 2022 was 20%. Forecasts indicate that by 2037, 28% of Thais will be 60 years of age or older, making the country an aging society.

According to the Mahidol University Institute for Population and Social Research (2022), an increasing number of people worldwide are dealing with chronic health problems because of scientific developments and longer life expectancies. The emphasis on the family members and caregivers of dependent patients has grown because of this shift in the population. Conditions that last a year or more and require continuous medical care limit everyday activities, or both are referred to as chronic illnesses. The following ailments are categorized as chronic diseases by the Centers for Disease Control and Prevention (CDC): arthritis, type 2 diabetes, cancer, heart disease, stroke, and obesity [1].

The World Health Organization (WHO) has released recommendations intended to help caregivers in their efforts to manage the requirements of people with chronic illnesses properly. The organization recognizes the urgency with which the healthcare system must be mobilized. In order to improve the general well-being and quality of life of people with chronic health issues, caregivers should make sure they have the necessary tools and methods to offer them high-quality care and support [2].

People who are chronically sick frequently have one or more chronic diseases that restrict their abilities, leading to functional reliance. As a result, people with disabilities typically require greater help with everyday tasks. According to data from Thailand's National Statistical Office, 417,000 individuals were dependent in 2016, making up 3.8% of the country's aged population overall. It is projected that 1,336,000 senior people—or 6.7% of the entire elderly population—will be unable to carry out everyday tasks in 2037 due to chronic illness (The Thailand National Statistical Office, 2016). These dependent people require caregivers to help with both their daily life activities and medical needs. Informal carers, also known as informal caregivers, are unpaid family members who help people who require assistance with daily living tasks, support, and care. Family caregivers are the backbone of systems for providing long-term care and are essential in helping patients who are reliant on them [3].

It is generally accepted that the complex and multifaceted elements impacting caregiver strain are indicators of the need for Long-Term Care (LTC). As of 2019, the National Health Commission Office in Thailand identified the caregiving setting, social context, expectations, and resources as important factors. Due to the fact that family caregivers' experiences along the course of the

disease and the needs of their care vary, the perception of burden is subjective. The time, energy, and effort demands placed on caregivers are complex and involve a multitude of tasks. These put a lot of strain on the family members, who seem to be the major informal caregivers at the moment. Caregiver load, according to earlier research, is the term used to describe the emotional, psychological, and financial difficulties associated with providing care for a loved one—typically a family member who is ill. Negative health effects, such as higher levels of anxiety and depression, less healthy behaviour, and stress, are directly linked to caregiver load. According to Katsarou, Intas, and Pierrakos [4], caregivers who live with chronically sick individuals feel stress in their personal lives, social isolation, financial hardship, and intrinsic reward. Moreover, international studies demonstrate the interdependence between caregivers and the patients they support, as well as the impact that the patient's level of functioning and course has on the caregiver's mental health [5-8]. The duration of the care is also an important factor for the caregiver's burden, *i.e.*, the longer the care, the greater the caregiver's burden and burnout; all of these indicate a poor quality of life for the patient's caregivers.

To manage these challenges, Thailand's Ministry of Public Health has promoted home-based care, training family members to assist with daily activities and health management. Despite this, caregivers often face fatigue, stress, physical health issues, and mental health challenges exacerbated by the lack of a designated primary caregiver. Social capital, including social networks and perceived support, plays a crucial role in improving health outcomes and quality of life. However, there is limited research on the quality of life of caregivers in Thailand, particularly in the Northeast region. This study aimed to determine the prevalence of quality of life among caregivers and its related factors to fill this gap and provide insights for developing strategies to enhance caregiver well-being and improve hospital-community cooperation.

2. METHODS

2.1. Study Design and Population

This cross-sectional study was conducted among 1,335 Dependent Patients' Caregivers aged 18-59 years in the Northeastern Region of Thailand. The survey used multi-stage random sampling to select participants from 4 health regions which represented the total population in the Northeastern region of Thailand. The inclusion criteria were caregivers who were the family members and had at least one year of experience in care. They had to communicate well, be proficient in Thai languages, and be willing to cooperate. Caregivers who did not reside in the area during data collection were excluded from this study.

2.2. Sample Size Calculation and Sampling Method

The sample size for this study was calculated using a formula for sample size determination in multivariable analysis, specifically using multiple logistic regression

statistics. The data was derived from a study on previous literature on stroke caregiver (Narissara Wongsombat, 2016). The variable of interest was the quality of life of caregivers for patients with dependency. Using the Hsieh, Bloch and Larson (1998). Formula for multivariate analysis in multiple logistic regression:

$$n = \frac{P(1-P)(Z_{1-\alpha/2} + Z_{1-\beta})^2}{B(1-B)(P_0-P_1)^2}$$

$$n = \frac{0.448(1-0.448)(1.960+0.840)^2}{0.458(1-0.458)(0.500-0.386)^2}$$

$$n = 600.978$$

The influence of the relationship between independent variables must be adjusted with the Variance Inflation Factor (VIF) value. The researcher selected $\rho=0.55$ as the minimum sample size for the study because it has a VIF value of 2.22, and the total sample size was 1,335.

Multistage sampling was used. Health regions were the primary sampling unit. Twenty provinces were randomly selected in the second step. Subsequently, district and subdistrict were randomly selected step by step to reach all of the samples.

2.3. Dependent Factors

The dependent variable in this study was the Quality of Life (QOL) of dependent patients' caregivers (poor/good).

2.4. Operational Definition

Dependent patients are individuals who are unable to perform daily activities independently or are completely disabled, scoring between 0 and less than 11 on the Barthel ADL index as assessed by medical personnel in Northeastern Thailand in 2023. Their caregivers, who are usually family members aged 18-59, assume the primary responsibility of care without receiving any financial compensation from the government or private sector. The duration of care is measured in years, rounded up to one year if it is six months or more. Caregivers' perception of care encompasses their awareness of the challenges and time commitment involved.

The concept of social capital encompasses the strength and readiness of social relationships and roles built on trust and cooperation within the community, including both perceptual and structural aspects. The quality of life for dependent patients is evaluated based on the caregivers' views regarding economic, social, physical, and mental health factors, as well as the social environment. Caregivers' mental health is influenced by their caregiving duties. Personal characteristics such as gender, age, education, religion, marital status, occupation, family size, income, living conditions, and healthcare entitlements also play a significant role in their ability to provide care.

2.5. Instrument and Data Collection

The questionnaire development process involved several steps. First, relevant documents, theories, and

previous research were reviewed. Next, the content scope was defined to create questionnaires and questions that ensured consistency with research objectives and relevant variables. Then, the quality of life questionnaire used WHOQOL-BREF and the Mental health questionnaire used (CES-D) by Radloff (1977), and the questionnaires were created and reviewed by seven thesis advisors and experts for content validity. The questionnaires were then revised based on feedback and tested with 30 caregivers of dependent patients aged 18-59 to evaluate the quality of the tools before actual implementation.

The validity of the questionnaire was assessed through content validity and reliability. To assess the reliability of the questionnaires, the researcher conducted a try-out pilot study with 30 caregivers of dependent patients aged 18-59, who exhibited characteristics similar to those of the study sample. After the trial pilot study, the reliability was calculated using Cronbach's Alpha Coefficient, with a reliability of 0.91

2.6. Statistical Analysis

All analyses were performed using Stata version 14.0 (Copyright of Khon Kaen University). Descriptive statistics such as frequency and percentage were used; however, for continuous data, mean, standard deviation, median, and maximum minimum were used. Simple logistic regression was performed to identify individual associations between each independent variable and weight loss product use. Independent factors with a P-value < 0.25 were processed for a Generalized Linear Mixed Model (GLMM) using multi-level analysis to identify the association between factors and QOL of dependent patients' caregivers when controlling for the effects of other covariates. The 4 health regions were divided into 8 provinces, and provinces were selected as random effects. The magnitude of association was presented as Adjusted Odds Ratios (AORs) and 95% Confidence Intervals (CIs). The significance level was set at $P < 0.05$.

2.7. Ethical Approval

Ethical approval Ethical approval for the study was obtained from the ethics committee in Human Research of Khon Kaen University, Khon Kaen, Thailand (HE672057).

3. RESULTS

As shown in Table 1, demographic and socioeconomic distribution among dependent patients' caregivers in the northeastern region of Thailand among 1,335 dependent patients' caregivers, the majority of the respondents were female (73.26%), 46.44% of them aged between 31-45 years, 54.76% had Primary /equivalent education, 97.53% were Buddhist, 57.83% married, 44.12% were farmers, 44.12% of their average family size was 5 - 6 persons (Tables 1 and 2).

The prevalence of QOL among caregivers of dependent patients. The examination of data from 1,335 caregivers of dependent patients in Thailand's Northeastern area revealed that 58.05 percent of caregivers of dependent patients had a low quality of life (Table 3).

Table 1. Sociodemographic of participants (n=1,335).

Personal Characteristics Factors of Caregivers	Quantity	Percentage
1. Gender		
Male	357	26.74
Female	978	73.26
2. Age Group (years)		
18 - 30	199	14.91
31 - 45	620	46.44
45 - 59	516	38.65
Mean (S.D.)	46.55	(12.77)
Median (Min: Max)	47	(20: 59)
3. Education Level		
No formal education	45	3.37
Primary /equivalent	731	54.76
Secondary/equivalent	192	14.38
High school/equivalent	219	16.40
Bachelor's degree	115	8.61
Postgraduate degree	33	2.47
4. Religion		
Christian	33	2.47
Buddhist	1,302	97.53
5. Marital Status		
Marital Status	31	2.32
Married	772	57.83
Divorced	163	12.21
Widowed	369	27.64
6. Occupation		
Government officer/State enterprise employee	72	5.39
Employee/Freelance	265	19.85
Unemployed	409	30.64
Farmer/Fisherman	589	44.12
7. Family Size (person)		
< 3	203	15.21
3 - 4	443	33.18
5 - 6	535	40.07
> 6	154	11.54
8. Average Monthly Income (THB)		
< 5,000	127	9.51
5,000 - 15,000	861	64.49
15,001 - 30,000	240	17.98
> 30,000	107	8.01
Mean (S.D.)	13,442.1	(10,605.86)
Median (Min: Max)	10,000	(1,600: 50,000)
9. Type of Residence		
Rented house/room	22	1.65
Commercial building	74	5.54
Two story house	608	45.54
Single house	631	47.27
10. Economic Status		
Sufficient with saving	34	2.55
Sufficient without saving	184	13.78
Insufficient with no debt	336	25.17
Insufficient with debt	781	58.50
11. Healthcare Coverage		
CSMBS	26	1.95
Social security scheme	39	2.92

(Table 3) contd....

Personal Characteristics Factors of Caregivers	Quantity	Percentage
Universal health coverage	1,270	95.13

Table 2. Caregiving factors of the sample group (n=1,335).

Factors Related to Providing Care	Quantity	Percentage
1. Duration of being a caregiver (years)		
< 5	465	34.84
5 - 10	600	44.95
11 -20	199	14.91
> 20	71	5.32
Mean (S.D.)	6.01	(5.20)
Median (Min: Max)	4	(1: 45)
2. Daily caregiving hours (hours)		
< 4	277	20.75
4 - 8	479	35.88
9 - 12	186	13.93
> 13	393	29.44
Mean (S.D.)	10.05	(8.10)
Median (Min: Max)	6	(2: 24)
3. Patient care activities in a day		
3.1 Feeding		
Oral feeding	757	56.70
NG tube feeding	163	12.21
Oral feeding and NG tube feeding	415	31.09
3.2 Body cleaning		
Changing diapers and Bathing	633	47.42
Changing diapers	440	32.96
Bathing	213	15.96
None	49	3.67
3.3 Medication Administration		
Oral	1,052	78.80
Oral	213	15.96
None	70	5.24
3.4. Physical Rehabilitation		
Changing posture and rehabilitation movement assistant	521	39.03
Changing posture	392	29.36
None	375	28.09
None	47	3.52
3.5 Assisting with excretion		
Urinary catheter care and fecal removal	832	62.32
Urinary catheter care	300	22.47
Fecal removal	152	11.39
None	51	3.82
3.6 Pressure Ulcer Care		
None	1,208	90.49
Bedsore but no wound dressing	54	4.04
Bedsore wound dressing sometimes	51	3.82
Bedsore wound dressing daily	22	1.65
4. Safe Environment for Patient Care		
4.1 Bed Rails		
None	1,003	75.13
Has	332	24.87
4.2 Cleaning of Medical Equipment		
None	1,003	75.13
Cleaning with detergent	233	17.45

(Table 2) contd....

Factors Related to Providing Care	Quantity	Percentage
Boiling/steaming	99	7.42
5. Impact of Being the Primary Caregiver		
None	972	72.81
Late for work	227	17.00
Took leave/absent from work	72	5.39
, Quit job	64	4.79
6. Body Mass Index (kg/m²)		
Underweight (< 18.25)	30	2.25
Normal (18.25 - 22.99)	678	50.79
Overweight (23.00 - 24.99)	214	16.03
Obesity level 1 (25.00 - 29.99)	356	26.67
Obesity level 2 (> 30)	57	4.27
Mean (S.D.)	23.28	(3.31)
Median (Min: Max)	22.51	(17.31: 37.25)
7. Chronic Diseases		
Had	928	69.51
None	407	30.49
8. Illness in the Past Month		
None	1,177	88.16
Had	158	11.84
9. Hospitalization in the Past Year		
None	1,229	92.06
Hospitalized	106	7.94
10. Accidents in the Past 3 Months		
None	1,311	98.20
Had accidents	24	1.80
11. Perceived Health Status (points)		
Poor- very poor (1-3)	294	22.02
Moderate (4-6)	792	59.33
Healthy - very healthy (7-10)	249	18.65
Mean (S.D.)	5.80	(1.60)
Median (Min: Max)	6	(3: 10)
12. Health Services Used		
Sub-district Health Promoting Hospital	743	55.66
Community hospital	457	34.23
Private clinic	96	7.19
General hospital / Regional hospital	39	2.92
13. Average Monthly Family Expenses (THB)		
< 5,000	55	4.12
5,000 - 15,000	57	4.27
15,001 - 30,000	1,079	80.82
> 30,000	144	10.79
Mean (S.D.)	9,989.21	(10,523.79)
Median (Min: Max)	8,000	(1,200: 60,000)
14. Average Monthly Family Expenses (THB)		
< 3,000	415	31.09
3,000 - 5,000	715	53.56
5,001 - 10,000	93	6.97
> 10,000	112	8.39
Mean (S.D.)	3,791.76	(5,020.10)
Median (Min: Max)	3,000	(500: 50,000)
Level of Knowledge		
Low	1,170	87.64
Average to High	165	12.36
Mean (S.D.)	2.98	(2.06)
Median (Min: Max)	3	(0: 10)

(Table 2) contd....

Factors Related to Providing Care	Quantity	Percentage
Attitude toward Care giving		
Poor to average	655	49.06
Good	680	50.94
Mean (S.D.)	19.08	(3.46)
Median (Min: Max)	18	(14: 25)
Mental Health Status		
No Depression	84	6.29
Depression	1,251	93.71
Mean (S.D.)	35.51	(11.50)
Median (Min: Max)	33	(20: 63)
Social Capital (Level)		
Low	594	44.49
Average	715	53.56
High	26	1.95
Mean (S.D.)	197.32	(46.04)
Median (Min: Max)	190	(120: 275)

Table 3. QOL of dependent patients’ caregivers (n= 1,335).

QOL	n	%	95%CI
Good	194	14.53	12.68 - 16.54
Average	366	27.42	25.04 - 29.89
Poor	775	58.05	39.28 - 44.65

4. DISCUSSION

The study identifies several critical factors that significantly affect the Quality Of Life (QOL) of caregivers for dependent patients in Northeastern Thailand. These

factors include age, economic status, monthly caregiving expenses, caregiving knowledge level, caregiving perception level, and mental health status. Here is a detailed discussion of each factor (Tables 4-6):

Table 4. QOL of dependent patients’ caregivers in Northeastern Thailand by bivariate analysis (n=1,335).

Personal Characteristics of Caregivers	n	Percentage of poor QOL	Crude OR	95%CI	p-value
1. Gender					0.075
Male	357	54.06	1	1	-
Female	978	59.51	1.26	0.97-1.63	-
2. Age Group (years)					<0.001
18 - 30	199	30.15	1	1	-
31 - 45	620	55.00	2.83	2.01-3.98	-
45 - 59	516	72.48	6.10	4.26-8.74	-
3. Education Level					0.156
No formal education	45	46.67	1	1	-
Primary /equivalent	731	58.41	1.60	0.87-2.94	-
Secondary/equivalent	192	61.98	1.86	0.97-3.58	-
High school/equivalent	219	53.42	1.31	0.69-2.49	-
Bachelor's degree	115	64.35	2.06	1.02-4.14	-
Postgraduate degree	33	51.52	1.21	0.49-2.98	-
4. Religion					0.443
Christian	33	51.52	1	1	-
Buddhist	1,302	97.53	1.31	0.65-2.61	-
5. Marital Status					0.616
Single	31	51.61	1	1	-
Married	772	57.25	1.25	0.61-2.58	-
Divorced	369	58.54	1.32	0.63-2.76	-
Widowed	163	61.96	1.53	0.70-3.30	-

(Table 4) contd....

Personal Characteristics of Caregivers	n	Percentage of poor QOL	Crude OR	95%CI	p-value
6. Occupation					<0.001
Unemployed	409	37.65	1	1	-
Government officer/State enterprise employee	72	58.33	2.32	1.39-3.86	-
Employee/Freelance	265	64.91	3.06	2.22-4.22	-
Farmer/Fisherman	589	69.10	3.70	2.84-4.83	-
7. Family Size (person)					<0.05
< 3	203	49.26	1	1	-
3 - 6	978	57.98	1.42	1.05-1.92	-
> 6	154	70.13	2.42	1.55-3.76	-
8. Average Monthly Income (THB)					<0.001
> 30,000	107	36.45	1	1	-
15,001 - 30,000	240	51.67	1.86	1.67-2.97	-
< 15,000	988	60.94	2.84	1.87-4.29	-
9. Type of Residence					0.593
Commercial building	74	52.70	1	1	-
Rented house/room	22	54.55	1.08	0.41-2.80	-
Single and Two-story house	1,239	59.43	1.26	0.78-2.02	-
10. Economic Status					<0.001
Sufficient with saving	34	40.22	1	1	-
Sufficient with out saving	184	44.12	2.17	1.56-2.45	-
Insufficient with no debt	336	47.02	2.32	1.94-2.89	-
Insufficient with debt	781	67.61	3.10	2.23-4.31	-
11. Healthcare Coverage					0.486
CSMBS	26	57.72	1	1	-
Social security scheme	39	64.10	1.31	0.67-2.54	-
Universal health coverage	1,270	65.38	1.38	0.61-3.13	-

Table 5. Quality of life of caregivers of dependent patients in Northeastern Thailand by bivariate analysis (n=1,335).

Factors Related to Providing Care	n	Percentage of poor QOL	Crude OR	95%CI	p-value
1. Duration of being a caregiver (years)					0.468
< 5 - 10	1,065	57.28	1	1	-
11 - 20	199	60.30	1.13	0.83 - 1.54	-
> 20	71	63.38	1.29	0.78 - 2.12	-
2. Daily caregiving hours (hours)					<0.001
< 4	277	37.91	1	1	-
4 - 8	479	54.49	1.96	1.45-2.65	-
9 - 12	186	67.74	3.44	2.32-5.09	-
> 13	393	72.01	4.21	3.04-5.49	-
3. Patient care activities in a day					-
3.1 Feeding	-	-	-	-	<0.001
Oral feeding	757	47.95	1	1	-
NG tube feeding	163	52.76	1.21	1.06-1.70	-
Oral feeding and NG tube	415	78.55	3.97	3.02-5.23	-
3.2 Body cleaning					<0.001
None	49	30.61	1	1	-
Bathing	213	51.64	2.61	1.24-4.70	-
Changing diapers and bathing	1,073	62.58	3.95	1.87-6.47	-
3.3 Medication administration	-	-	-	-	<0.001
None	70	24.29	1	1	-
Oral	1,052	58.65	4.42	2.52-7.74	-

(Table 5) contd....

Factors Related to Providing Care	n	Percentage of poor QOL	Crude OR	95%CI	p-value
NG Tube	213	66.20	6.10	3.29-11.30	-
3.4. Physical Rehabilitation					<0.001
None and movement assistant	422	48.10	1	1	-
Changing posture	392	58.35	1.67	1.12-1.96	-
Changing posture and rehabilitation	521	67.37	2.33	1.75-3.10	-
3.5 Assisting with excretion					<0.01
None	51	50.33	1	1	-
Urinary catheter care	300	59.35	1.44	1.12-1.88	-
Urinary catheter care and fecal removal	984	78.43	3.59	1.77-7.26	-
3.6 Pressure Ulcer Care					<0.001
None	1,208	55.38	1	1	-
Bedsore but no wound dressing	22	77.27	2.73	1.00-7.47	-
Bedsore wound dressing sometimes	51	81.48	3.54	1.77-7.11	-
Bedsore wound dressing daily	54	89.24	6.04	2.56-14.27	-
4. Safe Environment for Patient Care					-
4.1 Bed Rails					<0.05
Has	332	44.28	1	1	-
None	1,003	62.61	2.11	1.64-2.71	-
4.2 Cleaning of Medical Equipment					<0.01
None	1,003	54.24	1	1	-
Cleaning with detergent	233	66.95	1.71	1.27-2.31	-
Boiling/steaming	99	75.76	2.64	1.64-4.24	-
5. Impact of Being the Primary Caregiver					<0.001
None	972	54.01	1	1	-
Late for work	227	65.64	1.63	1.20-2.20	-
Took leave/absent from work, Quit job	136	74.26	2.45	1.64-3.68	-
6. Body Mass Index (kg/m²)					< 0.05
Underweight (< 18.25)	30	50.00	1	1	-
Normal (18.25 - 22.99)	678	56.05	1.27	0.61-2.65	-
Overweight (23.00 - 24.99)	214	57.01	1.33	0.62-2.85	-
Obesity level 1 (25.00 - 29.99)	356	59.27	1.45	0.69-3.07	-
Obesity level 2 (> 30)	57	82.46	4.70	1.75-12.63	-
7. Chronic Diseases					<0.01
None	407	41.03	1	1	-
Had	928	65.52	2.73	2.15-3.47	-
8. Illness in the Past Month					0.051
None	1,177	57.09	1	1	-
Had	158	65.19	1.41	0.99-1.99	-
9. Hospitalization in the Past Year					0.612
None	1,229	58.85	1	1	-
Hospitalized	106	60.38	1.11	0.74-1.66	-
10. Accidents in the Past 3 Months					0.191
None	1,311	54.82	1	1	-
Had accidents	24	70.83	1.77	0.73-4.30	-
11. Perceived Health Status (points)					<0.001
Healthy - very healthy (7-10)	249	39.80	1	1	-
Moderate (4-6)	792	58.84	2.16	1.64-2.84	-
Poor- very poor (1-3)	294	77.11	5.09	3.49-7.42	-
12. Health Services Used					<0.001
General hospital / Regional hospital	39	31.95	1	1	-
Community hospital	457	67.71	4.47	2.79-7.15	-
Private clinic	96	69.23	4.79	2.36-9.73	-
Sub-district Health Promoting Hospital	743	72.27	5.55	4.31-7.16	-

(Table 5) contd....

Factors Related to Providing Care	n	Percentage of poor QOL	Crude OR	95%CI	p-value
13. Average Monthly Family Expenses (THB)					0.597
< 5,000	55	53.73	1	1	-
5,000 - 15,000	57	54.39	1.07	0.51-2.25	-
> 15,000	1,223	58.46	1.26	0.73-2.17	-
14. Average Monthly Family Expenses (THB)					<0.001
< 3,000	415	42.17	1	1	-
3,000 - 5,000	715	60.98	2.14	1.67-2.74	-
5,001 - 10,000	93	78.49	5.00	2.94-8.52	-
> 10,000	112	81.25	5.94	3.59-9.92	-
Level of Knowledge					<0.001
Average to High	165	33.94	1	1	-
Low	1,170	61.45	3.10	2.20-4.37	-
Attitude toward Caregiving					<0.001
Good	680	45.59	1	1	-
Poor to average	655	70.99	2.92	2.32-3.66	-
Mental Health Status					<0.001
No Depression	84	22.62	1	1	-
Depression	1,251	60.43	5.22	3.09-8.82	-
Social Capital (Level)					0.059
High	26	51.00	1	1	-
Average	715	60.98	1.56	0.71-3.42	-
Low	594	54.88	1.22	0.55-2.67	-

Table 6. Factors related to the quality of life of caregivers of dependent patients in Northeastern Thailand by multivariable analysis (n=1,335).

Factors	n	Percentage of poor QOL	Crude OR	GLMM Adj. OR	95%CI	p-value
1. Age Group (years)						<0.001
18 - 30	199	30.15	1	1	1	-
31 - 45	620	55.00	2.69	2.70	1.83-3.99	-
45 - 59	516	72.48	6.10	4.30	2.84-6.51	-
2. Economic Status						<0.001
Sufficient with saving	34	40.22	1	1	1	-
Sufficient without saving	184	44.12	2.17	1.96	1.48-2.51	-
Insufficient with no debt	336	47.02	2.32	2.91	1.81-4.67	-
Insufficient with debt	781	67.61	3.10	5.89	3.85-9.01	-
3. Caregiving Knowledge Level						<0.001
Average to High	165	33.94	1	1	1	-
Low	1,170	61.45	3.10	2.43	1.63-3.64	-
4. Attitude Level						<0.001
High	680	45.59	1	1	1	-
Average	655	70.99	2.92	4.45	3.30-5.99	-
5. Mental Health						<0.001
No Depression	84	22.62	1	1	1	-
Depression	1,251	60.43	5.22	3.57	1.93-6.59	-

It has been found that caregivers aged 45-59 of dependent patients have a higher likelihood of experiencing poor quality of life compared to other age groups. This finding is consistent with previous studies, both internationally and in Thailand, which have identified age as a significant predictor of caregiver burden. According to Adelman *et al.* (2014) [9], age is a primary factor in predicting caregiver burden and related distress.

Nearly half of the caregivers are working-age individuals whose health deteriorates with age. This aligns with Orem's (1991) [10] concept that age indicates maturity or the ability to manage the environment, mental state, and perception. Age influences a person's self-care ability, which increases until adulthood and may decline in old age. Similarly, a study by Prachuntaen (2018) [11] found that age significantly affects the physical quality of life of

elderly caregivers. Factors considered include physical strength, daily caregiving capacity, and significant bodily changes at a 0.05 statistical significance level. The most impactful factor on physical quality of life is daily caregiving capacity. This research indicates that age is a crucial determinant of caregiving ability, decision-making, and overall caregiving capacity, which diminishes with age. Consequently, as caregivers age, their caregiving burden increases, leading to a decline in quality of life and increased difficulty in caregiving.

People with higher incomes are generally able to plan their lives better and choose the four basic necessities of life to meet their needs with higher quality compared to those with lower incomes. Economic and social issues, as well as financial problems or poverty, contribute to stress and anxiety, which in turn affect the quality of life. Moreover, income is an indicator of financial stability. Caregivers must be prepared to cover medical expenses and related activities for dependents. Those with higher incomes who can adequately meet necessary expenses will have a better quality of life compared to caregivers with lower and insufficient incomes. This is consistent with the study by Suttasri *et al.*, which found a moderate positive correlation between income and the quality of life of caregivers of chronic patients with dependencies [12].

The knowledge in caregiving reveals that caregivers with a low level of knowledge tend to have a poor quality of life. The knowledge of patient health care negatively impacts the health care of those who are dependent on the caregiver's health. This can be explained by the fact that caregivers who provide excellent care for those with health dependency have gained caregiving experience from various media, other individuals, and access to health care services related to patient care. This aligns with Green's concept, which states that knowledge is a fundamental factor that motivates an individual's actions and can lead to personal satisfaction derived from learning experiences. This is also consistent with studies by Ahmed and Ghaith (2018) [13], which found that internal factors affecting the performance of caregivers for dependent elderly are knowledge of elderly care. This knowledge promotes efficient caregiving, enhances the self-help capacity of those with dependencies, and maintains a good quality of life for caregivers.

Perception in caregiving studies shows that moderate perception is associated with a poorer quality of life. This is consistent with the study by Turnbull *et al.*, [14] which examined factors related to caregiving for homebound elderly. They found that perceptions and attitudes towards elderly care were at a moderate level. Additionally, it aligns with the study by Purimat *et al.* [15], which investigated factors influencing the quality of life of caregivers for dependent elderly in Chanthaburi Province. They found that perceptions of elderly care could predict 58.1% of the quality of life of caregivers for dependent elderly. However, this contrasts with the study by Promtingkarn *et al.* (2019) [16], which found that a positive attitude had the greatest impact on elderly care in the health service system. This study shows that perception in caregiving reflects gratitude and repayment of kindness towards parents, spouses, and others. Haley *et al.* (2009) [17] found that caregivers feel valued when caring for patients. Factors influencing and

predicting the quality of life of caregivers for dependent elderly include the attitude towards elderly care, with self-esteem being the most significant predictor. This can be explained by the fact that caregivers' self-worth and gratitude contribute to their sense of value, and if they are confident in their capabilities and have strong motivation, they can face various challenges and achieve a good quality of life. This is consistent with the study by Saban *et al.*, which found that the perception of self-worth was the most significant predictor of caregivers' quality of life [18].

Mental health of caregivers: Studies have found that depression is associated with a poorer quality of life, which studied the factors predicting stress coping in caregivers of spinal cord injury patients. It found that participants who received correct caregiving information were better able to make appropriate problem-solving decisions, leading to more effective stress coping. Additionally, previous studies have found that caregiver role stress and caregiver attitudes significantly explain the variance in caregiver readiness for caring for dependent elderly. Considering the weight and direction of caregiver role stress, it was found that lower caregiver role stress is associated with higher readiness to care for dependent elderly. Caregiver role stress is the most influential factor in predicting caregiver readiness to care for dependent elderly, leading to mental health problems, depression, and poor quality of life [19].

The burden on primary caregivers is related to the progression of psychiatric disorders and mental health. Common mental health problems in caregivers include anxiety (95%) and depression (45%). Symptoms of severe mental conditions (post-traumatic stress disorder) and psychological distress include feelings of helplessness, uncertainty, hopelessness, loss of dignity, guilt, and impaired quality of life [20].

CONCLUSION

The findings from this study have important implications for healthcare practice and policy. Interventions aimed at improving the QOL of caregivers should focus on:

1. Providing financial support or subsidies to alleviate the economic burden of caregiving.
2. Offering training and educational programs to enhance caregiving knowledge and skills.
3. Promoting positive perceptions of caregiving through counseling and support groups.
4. Ensuring access to mental health services to address and prevent depression among caregivers.

By addressing these factors, it is possible to improve the overall well-being and QOL of caregivers, which in turn can positively impact the care they provide to dependent patients. Future research should continue to understand the impact of diversity on caregivers' needs for support. It should also continue to develop and evaluate alternative models of care. Family-centered care may be the way forward to optimize care systems' abilities to meet the heterogeneous needs of family caregivers.

Ultimately, caregivers must be supported as they are essential to the well-being of those they care for and to the QOL of them.

AUTHORS' CONTRIBUTIONS

J.P.: Contributed to the study's concept and design; W.I.: Contributed to the validation; K.T. Wrote, reviewed, and edited the manuscript.

LIST OF ABBREVIATIONS

WHO = World Health Organization
 CDC = Centers for Disease Control and Prevention
 VIF = Variance Inflation Factor
 QOL = Quality of Life
 AORs = Adjusted Odds Ratios
 CIs = Confidence Intervals

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

Ethics approval was received from the Khon Kaen University Ethics Committee for Human Research, Thailand (Reference No. HE672057).

HUMAN AND ANIMAL RIGHTS

All human research procedures followed were in accordance with the ethical standards of the committee responsible for human experimentation (institutional and national) and with the Helsinki Declaration of 1975, as revised in 2013.

CONSENT FOR PUBLICATION

Informed consent was obtained from all participants.

STANDARDS OF REPORTING

STROBE guidelines were followed.

AVAILABILITY OF DATA AND MATERIALS

All data generated or analyzed during this study are available on request from the corresponding author [T.M.].

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CONFLICT OF INTEREST

The authors declare no conflict of interest, financial or otherwise.

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