

## Comparison of Personal Characteristic Factors Relating to Quality of Life in Patients with End-Stage Renal Disease<sup>1</sup>

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### Abstract

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**Objective:** The objective of this study was to compare the quality of life (QOL) of patients with end-stage renal disease (ESRD) between patients receiving hemodialysis (HD) and patients receiving continuous ambulatory peritoneal dialysis (CAPD) and to compare personal characteristic factors relating to the quality of life in patients with ESRD.

**Method:** This study used a descriptive research design. The sample was recruited using purposive sampling that included 76 ESRD patients receiving either HD or CAPD at a dialysis clinic in Phraphutthabat Hospital, Saraburi Province, Thailand. Data was collected using the Quality of Life Questionnaire for Chronic Kidney Disease (KDQOL-SF™) version 1.3. Independent t-test and ANOVA procedures were used to analyze study data.

**Results:** The results revealed that the HD patients had a moderate level of QOL. The highest scoring dimension of QOL was the encouragement of staff at the dialysis unit and patient satisfaction with the treatment ( $\bar{X} = 100$ ,  $SD=.00$ ), followed by social

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support ( $\bar{X}$  = 89.29, SD =16.88) and cognitive function ( $\bar{X}$  = 88.57, SD=11.82). On the other hand, the lowest scoring QOL dimension was physical problems ( $\bar{X}$  = 50, SD=51.89), and pain ( $\bar{X}$  = 50, SD=39.03), followed by work status ( $\bar{X}$  = 53.57, SD=45.84) and burden from kidney disease ( $\bar{X}$  = 58.48, SD=31.07). The CAPD patients also had a moderate QOL. The highest scoring QOL dimension was the encouragement of staff in the renal unit and patient satisfaction with the treatment ( $\bar{X}$  = 100, SD=.00), followed by social support ( $\bar{X}$  = 95.61, SD=14.20) and cognitive function ( $\bar{X}$  = 88.83, SD=13.52). The worst scoring QOL dimensions were work status ( $\bar{X}$  = 44.44, SD=42.72), general health ( $\bar{X}$  = 53.61, SD=39.05), and pain ( $\bar{X}$  = 62.70, SD=41.14). The difference overall and in each dimension of QOL in ESRD patients who were treated with HD and CAPD was not statistically significantly different. The QOL was not significantly different among patients with different personal characteristics except for income and duration of treatment; in those cases, the difference in QOL was statistically significant ( $p$ =.05).

**Conclusion:** The overall QOL and life expectancy of patients with ESRD treated with HD and CAPD are not affected by gender, age, marital status, education, occupation, or type of health coverage. QOL was not significantly different, except for patients with different incomes and duration of renal replacement therapy, whose QOL was significantly different. The QOL of patients receiving dialysis should be studied to develop a QOL program for patients with chronic kidney disease who receive dialysis.

**Keywords:** personal characteristic factors, quality of life, end-stage renal disease, hemodialysis (HD), continuous ambulatory peritoneal dialysis (CAPD)

## Background

Chronic Kidney Disease (CKD) is a major cause of illness worldwide, including in Thailand. Currently, among ASEAN countries, Thai people are the 3rd most likely to suffer from chronic kidney disease (Tanakitjaru, 2015). There were about 75,000 patients with end-stage renal disease (ESRD) who received renal replacement therapy (RRT), either hemodialysis (HD) or continuous ambulatory peritoneal dialysis (CAPD) in 2017 (Nephrology Society of Thailand, 2017).

Phraphutthabat Hospital, Saraburi, Thailand is a secondary care hospital that has a kidney unit providing care for ESRD patients who receive either HD or CAPD.

Between 2007 and 2015, there were 20-30 ESRD patients receiving dialysis at any time. The number of patients with ESRD receiving dialysis increased after that. In 2016, there were 104 ESRD patients receiving RRT in Phraphutthabat Hospital, according to the medical records maintained by Phraphutthabat Hospital, 2007-2016, which we received authorized permission to access.

Based on the pathological changes related to ESRD, patients have various problems due to kidney degeneration. Increasing poisonous wastes in their body cause dizziness, loss of appetite, weight loss, unconsciousness, blurred vision, diarrhea, loss of feeling in their extremities, itchy, dry skin, and cyanosis. Some feel tired, cry, experience frequent cramping, and/or have irregular heartbeats, chest pain, swelling, ecchymosis, blood in vomit, blood in their stools, anemia, and sleepless (Tanakitjaru, Bunnak, & Pichaiwong, 2018). Ukati and Chantajirakhovit (2007) found that the activities of patients with ESRD decreased, and patients also experienced unhappiness, suffering, and hardship in life. There are 2 treatments for chronic renal failure patients: the first is renal transplantation, which is high-cost and requires advanced technology. The patients registered for the transplant waiting list at the tertiary care hospitals. The Universal Coverage Scheme (UCS) covers less than the total cost of treatment for renal transplantation. It requires patients to pay a portion of the expenses themselves. The second is treatment to maintain renal function (HD and CAPD). Phraputtabat Hospital provides only the latter treatments. Patients receive HD directly in Phraphutthabat Hospital around 2-3 times per week for 4-6 hours per session at a high cost for patients covered by UCS. However, the cost of HD is covered without additional payment for those whose healthcare is paid by the Government Officer or Social Security Schemes. In contrast, CAPD exchanges are done by patients at home around 4 times a day, using gravity to help fill their abdomen with dialysate and retain its fluid about 4 hours before draining in 30 minutes. The latter treatment is still economical and requires spending less time at the hospital. Moreover, patients are better able to consume food and water with CAPD compared to HD (Sriyuktasuth, Vongsirimas, Praha, & Prapaiwong, 2017).

Quality of life (QOL) means the general well-being of individuals and societies, outlining negative and positive features of life. It observes life satisfaction, including

physical health, family, education, employment, wealth, safety, and security to freedom, religious beliefs, and the environment (Marcel, 2014). QOL differences due to treatment duration and advanced pathology have been reported. RRT may have a significant impact on patients' perception about various modalities of dialysis. Comparisons of QOL in patients receiving HD or CAPD have produced conflicting results. It is not clear from the previous studies which dialysis method provides better QOL. Then, as nurses, we intend to study the specific area around Phraphutthabat Hospital Saraburi Province, giving particular attention to socio-demographic data. The expected findings should provide more understanding to improve QOL for HD and CAPD patients.

The Phraphutthabat community is situated in a rural area where people often help each other, not only within their own families, but others as well. In addition, this community is ready to support each other using the best services from health promoting hospitals. Health volunteers are able to work closely with the surrounding villages.

Based on our literature review, there are many factors that affect the QOL of chronic renal patients in Thailand including age, marital status, education, occupation, income, type of health coverage, and duration of treatment. Previous studies suggested various factors, for instance age, education, and treatment duration were related to QOL. Age, income, and travel duration were not statistically significant factors in at least one study (Yesonkaw, Na-nongkai, Chayakul, & Sujitarat, 2016). On the other hand, age was statistically significantly related to QOL in another study (Bunyatnopparat & Anutrakulchai, 2017).

### **Objectives**

1. To compare the QOL of patients with ESRD between patients who receive HD and patients who receive CAPD.
2. To compare the QOL of patients with ESRD with personal characteristic factors such as age, marital status, education level, occupation, family income, type of

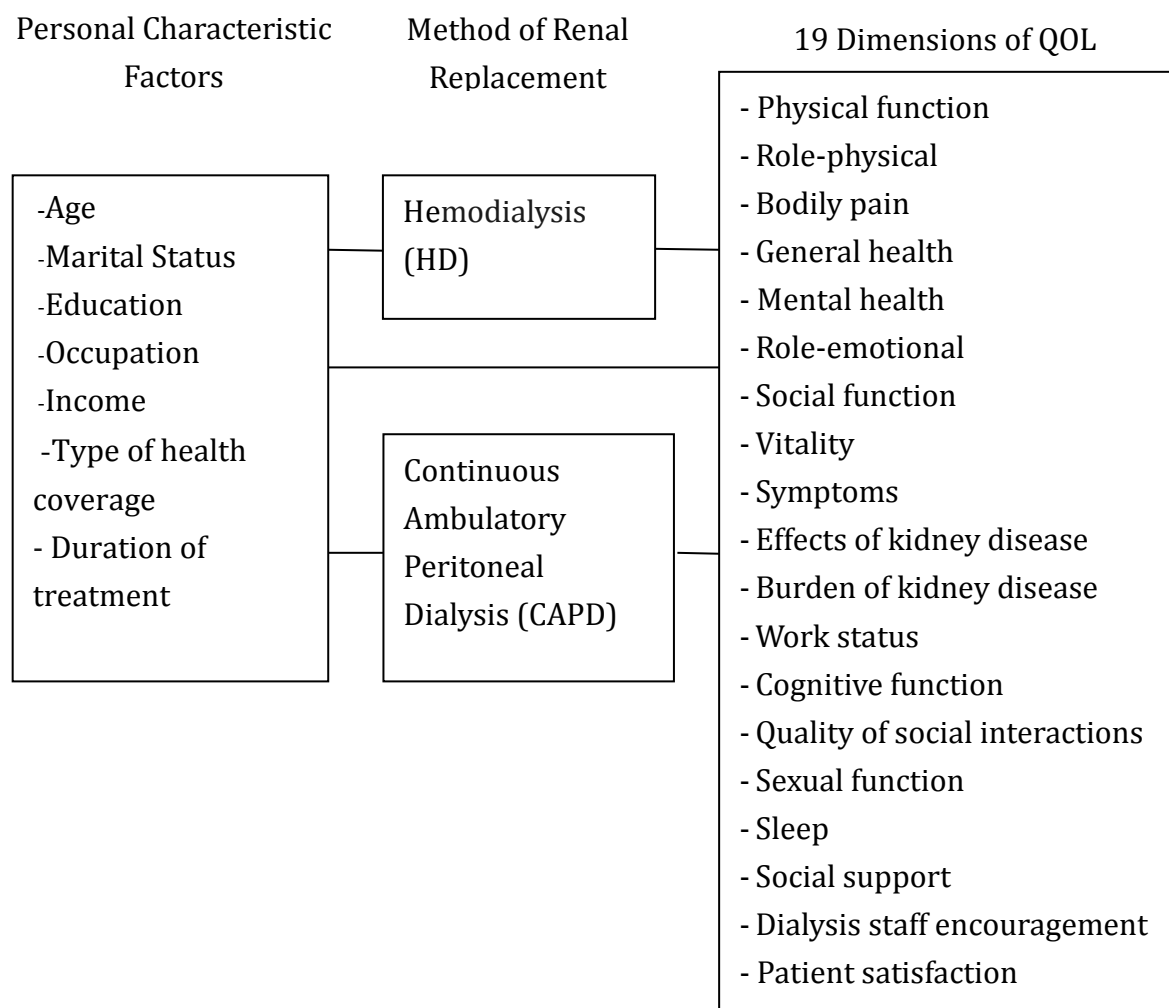
health coverage, and duration of treatment.

## Methodology

### Conceptual Framework

This research aimed to compare the QOL of patients with ESRD who were receiving either HD or CAPD and to compare the QOL of patients with ESRD with different personal characteristic factors. This study was based on the QOL according to the Kidney Disease Quality of Life Working Group in the United States. This concept was presented as part of holistic care, including physical, mental, and social aspects, which can consequently prolong life and decrease mortality. This major concept of QOL was divided into 19 dimensions. The conceptual framework for the research is as follows.

Figure 1: Conceptual Framework



## **Population and Sample**

The population is patients with ESRD who were receiving either HD (48 persons) or CAPD (57 persons) at Phraphutthabat Hospital during the 2015-2016 fiscal year. The total population includes 105 persons. Of these, 76 patients were selected, of whom 39 received HD and the remainder (37 patients) received CAPD. The inclusion criteria were 1) no communication problems, 2) normal awareness and consciousness, 3) born in Saraburi province 4) routine follow up in Phraphutthabat Hospital 5) Patients consciously and voluntarily agreed to participate in the research.

## **Research Instrument**

The KDQOL-SF™ Version 1.3 was created by the Kidney Disease Quality of Life-Working Group USA. It was revised and translated into Thai with input from experts. The process of instrument development was a cognitive interview and concurrent probing interview of 15 renal dialysis patients. All items' meaning in Thai were informative based on psychometric properties. The study was conducted in 2009. The research group was 191 patients receiving dialysis therapy due to chronic renal failure. Coefficient alphas ranged from .44 to .86. The coefficient of item-total correlation ranged from .53 to .95. The convergent validity was 74.17%. The discriminative validity was 88.81%. For this study, Cronbach's alpha was .73. The KDQOL-SF™ Version 1.3 is an 80-item instrument consisting of 19 dimensions measured using a 5-point Likert scale. The detailed scoring instructions for this instrument (Hays et al., 1995) result in a score 0-100, which can be used to divide overall quality of life into five categories: the lowest (<50 points), low (50-59 points), moderate (60 - 69 points), high (70-79 points), and the highest (>=80 points) (Homjean, 2009). The KDQOL-SF™ Version 1.3 is composed of nineteen dimensions of QOL, including physical function, (12 items), role-physical (4 items), bodily pain (2 items), general health (5 items), mental health (5 items), role-emotional (3 items), social function (2 items), vitality (4 items), symptoms (12 items), effects of kidney disease (8 items), burden of kidney disease (4 items), work status (2 items), cognitive function (3 items), quality of social interaction (3 items), sexual function (2 items), sleep (4 items), social support (2 items), dialysis staff encouragement (2 items), and patient satisfaction (1 item).

## **Data Collection**

Data were collected from April to September 2016. This research was approved by the Ethics Committee on Human Research of Boromarajonani Nursing College Phraphutthabat. The Certificate number was EC002/2016. The patients completed survey by 30-40 minutes at renal unit. All literate patients responded themselves but researchers or team members read the questionnaire to respondents who could not read.

## **Data Analysis**

Socio-demographic data and QOL were analysed by frequencies, percentages, means, and standard deviations. The comparison of QOL scores between patients who received HD and CAPD was conducted using independent t-tests. The comparisons between QOL and socio-demographic data used independent t-tests and ANOVA.

## **Results**

### **Socio-Demographic Data**

The majority of HD (58.97%) and CAPD (54.05%) patients are female. The mean age was 53 years old for HD patients and 59 years old for CAPD patients. Most of them were married (64.10% of HD; 64.86% of CAPD). The majority had attained an education level of no higher than primary school (48.72% of HD; 81.08% of CAPD). The majority were unemployed (38.46% of HD, 56.76% of CAPD). The mean family income was 11,500 baht/month (approximately \$361US) for patients receiving HD and 2,864.86 baht/month (approximately \$90US) for patients receiving CAPD. The majority received healthcare under the UCS (61.54% of HD; 97.30% of CAPD). The mean duration of treatment was 5 years, 10 months (HD) and 5 years, 8 months (CAPD).

The socio-demographic data of HD and CAPD patients is shown in Table 1.

*Table 1.* Frequencies, Percentages, and Means of Socio-demographic Data of HD and CAPD patients. (n= 76)

Variable	group	n	%	HD (n=39)	%	CAPD (n=37)	%
Sex	Male	33	43.42	16	41.03	17	45.95
	Female	43	56.58	23	58.97	20	54.05
Age	< 41 years	8	10.53	7	17.95	1	2.703
	41 - 50 years	8	10.53	4	10.26	4	10.81
	51 - 60 years	32	42.11	15	38.46	17	45.95
	61 - 70 years	21	27.63	9	23.08	12	32.43
	> 70 years	7	9.21	4	10.26	3	8.108
	Mean		56.22		53.41		59.19
Marital status	Single	7	9.21	5	12.82	2	5.41
	Married	49	64.47	25	64.10	24	64.86
	Widowed/ Divorced/ Separated	20	26.32	9	23.08	11	29.73
Education	Primary school or less	49	64.47	19	48.72	30	81.08
	Secondary School	18	23.68	14	35.90	4	10.81
	Diploma or Above	9	11.84	6	15.38	3	8.11
Occupation	Civil Servants	5	6.58	5	12.82	0	0.00
	Unemployed	36	47.37	15	38.46	21	56.76
	Farmer	10	13.16	2	5.13	8	21.62
	Merchant	6	7.89	5	12.82	1	2.70
	Employee	19	25.00	12	30.77	7	18.92



*Table 1.* Frequencies, Percentages, and Means of Socio-demographic Data of HD and CAPD patients. (n= 76) (Contd.)

Variable	group	n	%	HD (n=39)	%	CAPD (n=37)	%
Household Income (baht/ month) <sup>3</sup>	< 1,000	43	56.58	13	33.33	30	81.08
	1,001 – 10,000	12	15.79	10	25.64	2	5.41
	10,001 – 20,000	16	21.05	12	30.77	4	10.81
	>20,000	5	6.58	4	10.26	1	2.70
	Mean	7,296		11,500		2,864	
Type of health coverage	Government or State Enterprise Officer Social Security Scheme	6	7.89	5	12.82	1	2.70
	Universal Coverage Scheme	60	78.95	24	61.54	36	97.30
	< 1 year	5	6.58	3	7.69	2	5.41
	1-3 years	3	3.95	1	2.56	2	5.41
Duration of treatment	3 – 5 years	37	48.68	16	41.03	21	56.76
	>5 years	31	40.79	19	48.72	12	32.43
	Mean	5 years 9 months		5 years 10 months		5 years 8 months	

Overall, patients receiving HD or CAPD had a moderate QOL (X=67.56, SD=10.61 and X=68.15, SD=10.07, respectively). The QOL of patients receiving HD and CAPD is shown in Table 2.

<sup>3</sup> The following are the approximate values of Thai Baht in US Dollars 1000 Baht=31 USD; 10,000 Baht=\$314; 20,000=\$629.

Table 2. Mean, Standard Deviation and QOL of HD and CAPD Patients

QOL	HD			CAPD		
	$\bar{X}$	SD	Level	$\bar{X}$	SD	level
Physical function	72.86	31.36	High	71.08	33.56	High
Role-physical	50.00	15.89	Low	64.86	46.94	Moderate
Bodily pain	50.00	39.03	Low	62.70	41.14	Moderate
General health	65.65	37.68	Moderate	53.61	39.05	Low
Mental health	65.14	14.67	Moderate	70.78	22.76	High
Role-emotional	78.57	42.58	High	74.77	43.32	High
Social function	70.00	41.14	High	76.49	36.76	High
Vitality	72.14	17.62	High	76.03	21.13	High
Symptoms	80.36	11.63	Highest	82.29	11.88	Highest
Effects of kidney disease	67.19	16.29	Moderate	74.02	17.06	High
Burden of kidney disease	58.48	31.07	Low	65.37	22.18	Moderate
Work status	53.57	45.84	Low	44.44	42.72	Lowest
Cognitive function	88.57	11.82	Highest	88.83	13.52	Highest
Quality of social interaction	80.00	18.49	Highest	80.00	21.26	Highest
Sexual function	80.00	27.39	Highest	82.29	24.11	Highest
Sleep	68.04	43.64	Moderate	65.54	16.43	Moderate
Social support	89.29	16.88	Highest	95.61	14.20	Highest
Dialysis staff encouragement	100.00	.00	Highest	100.00	.00	Highest
Patient satisfaction	100.00	.00	Highest	100.00	.00	Highest
Overview	67.56	10.61	Moderate	68.15	10.07	Moderate

The highest dimension of QOL was dialysis staff encouragement and patient satisfaction ( $\bar{X}$  =100, SD =0.00) in both groups. For QOL of patients receiving HD, the dimensions with the lowest scores were role-physical ( $\bar{X}$  =50.00, SD=51.89) and bodily pain ( $\bar{X}$  =50.00, SD=39.03), respectively. For patients receiving CAPD, the lowest score was work status ( $\bar{X}$  =44.44, SD=42.72).

Table 3. Comparison of the Mean Scores of QOL and Method of RRT (n=76)

QOL	Method of Renal replacement therapy	$\bar{X}$	SD	<i>t</i>	<i>p</i>
Physical function	HD	72.86	31.36	.172	.864
	CAPD	71.08	33.56		
Role-physical	HD	50.00	51.89	.981	.332
	CAPD	64.86	46.94		
bodily pain	HD	50.00	39.03	.997	.323
	CAPD	62.70	41.14		
General health	HD	65.65	37.68	.992	.326
	CAPD	53.61	39.05		
Mental health	HD	65.14	14.67	.857	.396
	CAPD	70.78	22.76		
Role-emotional	HD	78.57	42.58	.281	.780
	CAPD	74.77	43.32		
Social function	HD	70.00	41.14	.544	.589
	CAPD	76.49	36.76		
Vitality	HD	72.14	17.62	.606	.548
	CAPD	76.03	21.13		
Symptom	HD	80.36	11.63	.488	.629
	CAPD	82.29	11.88		
Effects of kidney disease	HD	67.19	16.29	1.210	.233
	CAPD	74.02	17.06		
Burden of kidney disease	HD	58.48	31.07	.884	.381
	CAPD	65.37	22.18		
Work status	HD	53.57	45.84	.665	.509
	CAPD	44.44	42.72		
Cognitive function	HD	88.57	11.82	.063	.950
	CAPD	88.83	13.52		
Quality of social interaction	HD	80.00	18.49	.000	1.000
	CAPD	80.00	21.26		
Sexual function	HD	80.00	27.39	.172	.866
	CAPD	82.29	24.11		

Table 3: Comparison of the Mean Scores of QOL and Method of RRT (n=76) (Contd.)

QOL	Method of Renal replacement therapy	$\bar{X}$	SD	t	p
Sleep	HD	68.04	43.64	.300	.766
	CAPD	65.54	16.43		
Social support	HD	89.29	16.88	1.347	.184
	CAPD	95.61	14.20		
Dialysis staff encouragement	HD	100.00	.00	.000	1.000
	CAPD	100.00	.00		
Patient satisfaction	HD	100.00	.00	.000	1.000
	CAPD	100.00	.00		
Overview	HD	67.56	10.61	.184	.855
	CAPD	68.15	10.07		

The results (see Table 3) showed that patients receiving HD had a higher the QOL than the CAPD group in terms of the following 5 dimensions: physical function, general health, role-emotional, work status, and sleep. There was no difference between patients in the two treatment groups in the following QOL dimensions: quality of social interaction, dialysis staff encouragement, and patient satisfaction. The differences in the other dimensions of QOL were not statistically significant.

### Comparison of the QOL and Socio-Demographic Factors

A comparison of the QOL of patients receiving RRT with socio-demographic factors are presented in Tables 4 and 5.

Table 4. Comparison of the QOL of Patients Receiving RRT (Gender) (n=76)

Variable	Gender	n	$\bar{X}$	SD	df	t	Sig.
Sex	Male	33	73.24	13.07	74	.241	0.81
	Female	43	72.59	10.57			

The QOL of male and female patients was not different.

*Table 5.* Comparison of the QOL of Patients Receiving RRT (Various Personal Demographics) (n=76)

Variable	n	$\bar{X}$	SD	df	F	Sig.	
Age	< 41 years	8	76.13	7.94	4	0.537	0.709
	41 - 50 years	8	75.67	8.30			
	51 - 60 years	32	73.15	13.93			
	61 - 70 years	21	70.21	11.23			
	> 70 years	7	72.67	8.24			
Marital status	Single	7	75.31	7.39	2	0.82	0.446
	Married	49	73.65	11.32			
	Widows	20	70.12	13.54			
Education	Primary school or less	49	71.88	12.38	2	.503	.607
	Secondary school	18	74.83	10.55			
	Diploma or above	9	74.39	9.88			
Occupation	Civil servant	5	80.50	6.27	4	2.029	.099
	Unemployed	36	70.84	11.89			
	Farmer	10	69.60	9.36			
	Merchant	6	81.87	13.18			
	Employee	19	73.61	11.45			
Income (baht/month)	< 1,000	44	68.86	12.00	3	4.250	.008
	1,001 – 10,000	11	78.04	9.57			
	10,001 – 20,000	16	77.32	9.48			
	>20,000	5	79.59	7.08			
Type of health coverage	Government or State Enterprise Officer	10	74.58	15.34	2	.159	.853
	Social Security Scheme	6	73.28	11.81			
	Universal Coverage Scheme	60	72.35	11.13			
Duration of treatment	< 1 year	5	59.08	13.25	3	9.809	.000
	1-3 years	3	65.74	11.61			
	3 – 5 years	37	69.59	10.51			
	>5 years	31	79.71	8.69			

Table 5 shows that the QOL of patients receiving RRT for ESRD was not related to their age, marital status, education, occupation, or type of health coverage. Their QOL was related (for at least one pair) to their income level ( $p=.008$ ) and duration of treatment ( $p<.001$ ).

*Table 6. Post-Hoc Comparison of QOL in Patients with ESRD receiving RRT Classified by Income*

Income (baht/month)	$\bar{X}$	< 1000	1,001 – 10,000	10,001 – 20,000	>20,000
< 1,000	68.86	-	.008	.010	.041
1,001 – 10,000	78.04		-	.770	.857
10,001 – 20,000	77.32			-	.685
>20,000	79.59				-

Table 6 shows that the difference in QOL of patients with ESRD between those with almost no income (<1,000 baht/month or \$34US) and all other income groups was different at least the .05 level ( $p=.008-.041$ ). There was no statistically significant difference among the other income groups.

*Table 7. Post-Hoc Comparison of QOL in Patients with ESRD receiving RRT Classified by Duration of Treatment.*

Duration of treatment	$\bar{X}$	< 1 year	1-3 years	3 – 5 years	>5 years
< 1 year	59.08	-	.365	.031	.000
1-3 years	65.74		-	.524	.024
3 – 5 years	69.59			-	.000
>5 years	79.71				-

ESRD patients who have been receiving treatment for more than 5 years have a significantly higher QOL at least the .05 level.

## Discussion

Patients receiving HD and CAPD had a moderate overall QOL because both methods were time consuming. Treatment affected their work and social life, and they also had expenses for some equipment of HD treatment and also traveling to the hospital. In addition, the cost of treatment increased. They depended on caregivers to take them to the hospital. They experienced poor health, low immune function, and it was easy for them to get infections. It is difficult to live a normal life, and so they faced a reduced quality of life. However, caregivers and nurses took good care of them. There were three dimensions that showed a high mean score including 1) dialysis staff encouragement, 2) social support and 3) patient satisfaction. However, the overall mean score QOL was moderate. The findings support results of previous studies. Aiyasanon (2009) and Ukati and Chantajirakhovit (2007) studied RRT by HD and CAPD. The results of these studies revealed a moderate QOL in both groups.

Based on the comparison between permanent HD and CAPD patients, there was no statistical difference in QOL overall or in any specific dimension. This might be caused by other specific support, for instance support from relatives and health staff. Respondents reside in a rural area with help from extended family members and health staff in the hemodialysis unit. As a result, satisfaction with the health staff and treatment had the highest possible score ( $\bar{X}=100$ ,  $SD.=0.00$ ). Respondents were ready and confident to address their health problems. There were no statistical differences in QOL compared to patients receiving HD or CAPD in Northern, Thailand (Laolam, et al., 2014).

ESRD patients did not experience a statistically different QOL based on age, marital status, educational level, occupation, or type of health coverage. However, QOL was related to income and duration of treatment. Patients with low incomes had a lower QOL than those who had higher incomes. Therefore, income is a significant factor affecting QOL, which is consistent with Russo et al. (2010) and Wichaisak (2017). Moreover, other studies (Khumwong, 2011; Wanachad, Nanthamongkolchai, Munsawaengsub, & Taechaboonsersak, 2015) have also found a statistically significant connection between income and QOL. In addition, patients who had spent much time in chemotherapy had a higher QOL than those who had been in treatment

for less time. Knowledge, understanding of self-management, and health acceptance are factors that support better patient living adaptations. These findings supported QOL being positively related to the factors family income and a treatment duration of at least four years (Wichaisak, 2017).

## **Recommendations**

### **Suggestions for Applying the Research Results in Other Patients**

The results of the study show that patients being treated with CAPD had the lowest QOL in work status. To improve the QOL of patients, intermittent peritoneal dialysis or automated peritoneal dialysis that provides dialysis continuing at night could be used. This would contribute to allowing patients to work regularly during the day. We recommend that the government should allow the patients to rent the automated peritoneal dialysis machine at a lower cost. HD patients had a limited QOL due to physical problems and pain. Therefore, physicians and health care staff should be aware of the patients' problems by understanding methods to control electrolytes, blood urea nitrogen, and creatinine during each dialysis treatment.

### **Suggestions for Future Research**

Researchers should continue to study the QOL of individual patients with renal failure who presented low scores in various dimensions and study the predictive factors of QOL of patients with renal failure who receive RRT treatment.

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