คุณภาพชีวิตและปัจจัยที่สัมพันธ์ในผู้ป่วยโรคไตเรื้อรังระยะสุดท้ายที่รับบริการฟอกเลือดด้วยเครื่องไตเทียม: การศึกษาภาคตัดขวาง ณ โรงพยาบาลชุมชนแห่งหนึ่งในจังหวัดนครปฐม

Quality of Life and Its Associated Factors in Patients with End-stage Renal Disease Receiving Hemodialysis: A Cross-sectional Study at A Community Hospital in Nakhon Pathom Province, Thailand

นิพนธ์ต้นฉบับ **Original Article**

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บทคัดย่อ

วัตถุประสงค์: 1) ประเมินคุณภาพชีวิตของผู้ป่วยโรคไตเรื้อรังระยะสุดท้าย และ 2) ค้นหาปัจจัยที่มีความสัมพันธ์ต่อคุณภาพชีวิต ในผู้ป่วยโรคไตเรื้อรังระยะสุดท้าย ที่มารับบริการฟอกเลือดด้วยเครื่องไตเทียม ณ โรงพยาบาลประจำอำเภอ จังหวัดนครปฐม **วิธีการศึกษา**: การศึกษาเชิงพรรณนาแบบภาคตัดขวาง ในผู้ป่วยโรคไตเรื้อรังระยะสุดท้าย จำนวน 92 ราย ที่มารับบริการฟอกเลือดด้วยเครื่องไตเทียมที่โรงพยาบาล เก็บข้อมูลประวัติการรักษาพยาบาลที่โรงพยาบาลผ่านระบบสารสนเทศของโรงพยาบาล และสัมภาษณ์ผู้ป่วยผ่านแบบสอบถามข้อมูลเบื้องต้นและชุดคำถาม SF-36 ในการประเมินคุณภาพชีวิตทั้ง 8 มิติ **ผลการศึกษา** : คุณภาพชีวิตในแต่ละมิติมีค่าเฉลี่ยและส่วนเบี่ยงเบนมาตรฐานดังต่อไปนี้ การทำงานเชิงกายภาพ (17.87 ± 5.97) บทบาททางกายภาพ (4.95 ± 1.43) ความเจ็บปวดทางกาย (8.22 ± 2.51) สุขภาพทั่วไป (14.78 ± 4.76) ความมีชีวิตชีวา (15.19 ± 3.65) การทำงานด้านสังคม (7.46 ± 1.88) บทบาทด้านอารมณ์ (3.87 ± 1.22) และสุขภาพจิต (21.66 ± 4.74) ตามลำดับ สอดคล้องกับการศึกษาอื่นๆ และพบความสัมพันธ์ระหว่างคุณภาพชีวิตบางด้านกับประวัติการการรักษาหรือสถานะของผู้ป่วยในบางประเด็น ได้แก่ รายได้ การได้รับยาช่วยเพิ่มเม็ดเลือดแดง การศึกษา การมีผู้ดูแล และผลตรวจทางห้องปฏิบัติการภาวะโลหิตจาง (TIBC) **สรุป:** ผู้ป่วยโรคไตเรื้อรังที่ได้รับการฟอกเลือดด้วยเครื่องไตเทียม ณ โรงพยาบาลมีคุณภาพชีวิตต่ำกว่าบุคคลทั่วไป ควรให้ความสนใจในเรื่องบทบาทเชิงกายภาพ และความมีชีวิตชีวาที่จะช่วยส่งเสริมให้ผู้ป่วยมีคุณภาพชีวิตที่ดีขึ้น นอกจากนี้การให้ความรู้เกี่ยวกับสภาวะโรค ค่าใช้จ่าย การได้รับยาช่วยเพิ่มเม็ดเลือดแดงที่เหมาะสมและติดตามผลทางห้องปฏิบัติการที่สำคัญ อาจช่วยปรับปรุงคุณภาพชีวิตของผู้ป่วยให้ดีขึ้น

คำสำคัญ: โรคไตเรื้อรัง, คุณภาพชีวิต, เครื่องไตเทียม

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Abstract

Objectives: 1) To assess the quality of life of patients with end-stage renal disease and 2) to identify factors related to quality of life in patients with end-stage renal disease receiving hemodialysis services at a district hospital in Nakhon Pathom Province. **Methods:** a cross-sectional descriptive study was conducted in 92 patients with end-stage renal disease receiving hemodialysis services at the hospital. Medical history data were collected through the hospital's information system. Moreover, interviewed the patients through the preliminary questionnaire and SF-36 questions to assess the quality of life in all 8 dimensions. **Results:** The quality of life in each dimension has the following mean and standard deviation: physical functioning (17.87 ± 5.97), physical role (4.95 ± 1.43), physical pain (8.22 ± 2.51), general health (14.78 ± 4.76), vitality (15.19 ± 3.65), social functioning (7.46 ± 1.88), emotional role (3.87 ± 1.22), and mental health (21.66 ± 4.74), respectively. This is consistent with other studies and found a relationship between some aspects of quality of life and the treatment history or status of the patients in some areas, including income, taking medications to increase red blood cells, education, having a caregiver, and the results of the anemia laboratory test (TIBC). **Conclusion:** Patients with chronic kidney disease receiving hemodialysis at the hospital have a lower quality of life than the general population. Attention should be paid to the physical role. The vitality that will help promote a better quality of life for patients. In addition, providing education about the disease condition, costs, receiving appropriate red blood cell-boosting medications and following up on important laboratory results may help improve the quality of life for patients.

Keywords: chronic kidney disease; quality of life, hemodialysis

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Introduction

Chronic kidney disease (CKD) is a significant public health problem and a challenge both globally[1] and nationally due to its steadily increasing prevalence[2,3]. Once a patient reaches end-stage renal disease (mostly Stages 4 and 5), three treatment options are available: continuous ambulatory peritoneal dialysis (CAPD), hemodialysis (HD), and kidney transplantation[4,5]. According to the Medical and Health Data Center (HDC) of the Ministry of Public Health, the number of patients with chronic kidney disease receiving care at hospitals, classified by stage, in 2025, with Stages 4 and 5 accounting for 182, 984 and 102,588 patients, respectively[6]. It is a particularly alarming number. Chronic kidney disease

not only impacts patients' quality of life, but also leads to high mortality rates, high treatment costs, and multiple impacts[7], such as increased hospital admissions and an increased risk of cardiovascular disease. This is the main cause of death in both hemodialysis patients (19.2%) and peritoneal dialysis patients (6.6%). From the study[8], the number of chronic kidney disease patients receiving hemodialysis has been continuously increasing from 2000-2022. In 2022, there were 24,439 patients receiving peritoneal dialysis and 86,325 patients receiving hemodialysis. It was found that in 2023, there were 62,386 patients with chronic kidney disease stage 5 requiring hemodialysis[8].

Quality of life refers to the level of well-being, happiness, and satisfaction with life, including physical, mental, social, and emotional aspects, as well as individual social life[9]. Factors affecting individuals in society inevitably improve or deteriorate a patient's quality of life. In quality of life studies, the Short Form Health Survey-36 (SF-36) is a standardized questionnaire widely accepted internationally[10]. It has been widely translated into many countries due to its reliability and popularity in measuring health-related quality of life in many diseases, including in patients with chronic kidney disease undergoing hemodialysis[11]. As reported in both domestic and international studies, such as the Short Form Health Survey-36 (SF-36), the quality of life of patients with chronic kidney disease was lower than that of the general population[12]. In Turkey, a Quality of Life (QOL) study found that patients with chronic kidney disease undergoing hemodialysis, peritoneal dialysis, and kidney transplantation had lower quality of life than the general population[13]. A study in Thailand found that patients with chronic kidney disease undergoing hemodialysis and peritoneal dialysis had a moderate quality of life and significantly lower quality of life scores on the SF-36 than those in the normal population. Quality of life scores decreased as the disease progressed[14].

The SF-36 questionnaire is widely used both domestically and internationally because it can assess quality of life in various groups of people and diseases. It consists of 36 questions divided into 8 dimensions (aspects), namely, physical functioning (10 questions), role limitation due to physical problems (4 questions), bodily pain (2 questions), general health perceptions (5 questions), social functioning (2 questions), vitality (4 questions), role limitations due to emotional problems (3 questions), general mental health (5 questions), and one independent question (Reported health transition). After the assessment, the score can be calculated, divided into 2 parts (Figure 2): physical component scale (PCS) and mental component scale (MCS)[10]. The possible score ranges from 0 to 100, with high scores indicating good quality of life. The average scores for both measures in the healthy Thai population were 72.5-76.1 and 70.4-78.3, respectively[7, 15].

Don Tum Hospital is a district hospital in Nakhon-Pathom province. Its dialysis unit, staffed by qualified personnel and equipment, can serve 35 hemodialysis patients per day. Patients typically receive services at least twice a week and spend at least three hours at the hospital per visit. However, there have been no previous studies on the quality of life of chronic kidney disease patients receiving hemodialysis at the hospital. Therefore, this study aimed to assess the quality of life using the SF-36 questionnaire for chronic kidney disease patients receiving hemodialysis and to examine the relationship between quality of life and various factors in chronic kidney disease patients **(Figure 1)**, such as gender, age, occupation, health care, social environment, socioeconomic status, and smoking history. Furthermore, the study examined laboratory results[5] that may be associated with quality of life in this patient population. This study aimed to apply the results to the study population in the area, providing guidelines for patient care and improving the care of chronic kidney disease patients requiring hemodialysis. of the hospital to continue to provide patients with a better quality of life

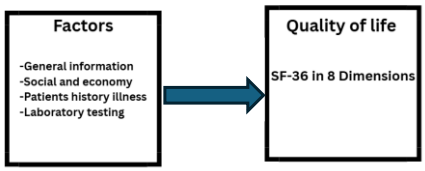

Figure 1. Conceptual framework for research on quality of life of chronic kidney disease patients receiving hemodialysis.

Methods

This cross-sectional descriptive study examined quality of life using the SF-36 form, medical history, and laboratory test results of patients receiving hemodialysis services at Don Tum Hospital, Nakhon-Pathom province, from July to October

2019. The study aimed to identify associations related to patients' quality of life.

Population and Sample

The study population consisted of all chronic kidney disease patients receiving hemodialysis services at Don Tum Hospital, Nakhon-Pathom province, from July to October 2019. All patients receiving services during this period were purposively selected. Participants received an explanation of the study objectives and voluntarily consented to participate by signing a participant's consent form.

Inclusion criteria for the study included patients being 18 years of age or older, diagnosed with end-stage renal disease by a physician, receiving regular hemodialysis for at least three months, being fully conscious, able to communicate and answer questions, and consenting to the study by signing a consent form.

Exclusion criteria included a diagnosis of an invasive infectious disease. Recurrent or terminal cancer, death, and incomplete patient data collected were not analyzed.

Data collection included all patients during the study period, selecting patients who consented to participate upon receiving services at the hospital. Therefore, no sample size calculations were performed. The study took four months to cover all patients receiving services. Participants obtained patient permission before interviewing and completing the questionnaires.

Data Collection Tools

1) A questionnaire for general history and information, divided into two parts: Part 1: A record of basic patient information, including gender, age, religion, education level, marital status, occupation and income, treatment rights, smoking, alcohol consumption, presence of a caregiver, family role, duration of treatment initiation, red blood cell-boosting medications, frequency of dialysis, hospital stay, and infectious disease cases within the past year. Part 2: Laboratory test results. Data were collected on the day the patient visited the hospital. The physician performed routine tests and recorded the first laboratory results within four months. The data were used to assess the patient's medical condition, comparing them with the hospital's standard laboratory test results. For example: Blood tests (Hct, Hb, WBC, Plt, MCV), kidney function (BUN, Cr), mineral levels (Ca, PO4, Na, K, Cl), albumin levels (Alb), and other blood tests (HBsAg, HBsAb, TIBC, HBs titer, Anti-HCV, HIV), etc., were authorized to retrieve test results and laboratory values from the hospital's information system on the day of the patient's appointment. This questionnaire was reviewed for content validity by experts.

2) The Short-Form Health Survey 36 (SF-36) assessed quality of life, covering both physical and mental dimensions, covering a total of eight dimensions. The questionnaire consisted of 36 items. Researchers interviewed patients and filled in the questionnaire based on the scores they selected. The researchers then calculated the patients' scores using a formula, where 0 points represented the worst quality of life and 100 points represented the best quality of life.

This research project was approved by Silpakorn University Human Research Ethics Committee No. 10/2019 Evaluation and data analysis using MS Office (Excel) 2021 and PSPP (GNU pspp 2.0.0-g5b54d1) programs by presenting descriptive statistics according to the characteristics of group variables in the form of frequency (Frequency), percentage (Percentage), quantitative variables in the form of mean (Mean) and standard deviation (Standard deviation). As for the data analysis of factors affecting quality of life, the relationship between variables was analyzed using Pearson correlation and the relationship analysis of qualitative variables with Chi-square, determining statistical significance ($p<0.05$).

Results

The number of chronic kidney disease patients receiving treatment at Don Tum Hospital, Nakhon-Pathom province, has been steadily increasing. Therefore, Don Tum Hospital, Nakhon-Pathom province, has established a dialysis center to provide services to patients with chronic kidney disease requiring hemodialysis. This study demonstrates the importance of studying patient quality of life using the SF-36 health survey and examining factors affecting quality of life in patients with chronic kidney disease at the hospital. The study results can be used to improve patient care. The results can be used to plan and develop strategies to improve the quality of life of patients with chronic kidney disease.

Chronic kidney disease patients receiving hemodialysis services There were 92 patients in total, with a mean age of 58.82±15.26 years. 41 patients (44.56%) had a history of diabetes and 34 patients (36.96%) had hypertension. The 68 patients (73.91%) had self-payment rights for treatment, and more than half (50 patients (54.35%) had an average monthly income of less than 10,000 baht **(Table 1).** Of these (64 patients) had a care giver (69.57%), 42 patients (45.65%) had been a family leader. The duration of treatment initiation ranged from 1 to 5 years, with 47 patients (51.09%) receiving dialysis twice weekly and 40 patients (43.48%) receiving various forms of red blood cell-boosting medications. Laboratory test results were not within normal criteria, namely, blood concentration (Hct) was lower than normal in 62 cases (66.67%), renal function (Cr) was higher than normal in 54 cases (58.06%), and albumin was lower than normal in 30 cases (32.26%) **(Table 2)**.

Table 1. Basic information of 92 patients with chronic kidney disease undergoing hemodialysis.

Description	Value (percentile)
Average **age** (years)(Mean ± Standard Deviation)	58.82 ± 15.26
Male	54 (58.06%)
Female	38 (41.94%)
Comorbidities with Kidney Disease	
- Diabetes	41 (44.56%)
- Hypertension	34 (36.96%)
- Other Diseases, such as Heart Disease, Coronary Artery Disease	17 (18.48%)
Smoking	
- Never smoked or quit	89 (96.74%)
- Currently smoker	3 (3.26%)
History of Alcohol Drinking	
- Never drank	67 (72.83%)
- History of drinking	25 (27.17%)
Education Level	
- Below Bachelor's Degree	81 (88.04%)
- Bachelor's Degree or Higher	11 (11.96%)
Occupation	
- Unemployed	43 (46.74%)
- Employed	49 (53.26%)
Rights to treatment	
- Reimbursable (Government Official, Social Security, Gold Card)	68 (73.91%)
- Self-payment	24 (26.09%)
Average Income (Baht)	
- Less than 10,000 Baht per month	50 (54.35%)
- More than 10,000 Baht per month	42 (45.65%)

Table 2: Health care information of 92 patients with chronic kidney disease.

Information on:	Value (percentile)
Caregiver status	
-Yes	64 (69.57%)
-No	28 (30.43%)
Patient's role in the family	
-Head of household	42 (45.65%)
-Family member	50 (54.35%)
Duration of treatment (years)	
-Under 15 years	14 (15.21%)
-1-5 years	47 (51.09%)
-More than 5 years	31 (33.70%)
Red blood cell-enhancing medications	
-Not receiving medications	3 (3.26%)
-1=Epiao 4000U every 2 weeks	10 (10.87%)
-2=Espogen 4000U every 2 weeks	20 (21.74%)
-3=Eprex 5000 every 2 weeks	57 (61.96%)
-4=Renogen 4000 every 2 weeks	2 (2.17%)
Dialysis frequency	
-2 times a week	52 (56.52%)
-3 times a week	40 (43.48%)
Hospitalizations in the past year (yes or no)	
-None	40 (43.48%)
-Yes, at least 1 time	52 (56.52%)
-Number of admission at hospital	Average 1.7 time/year
Infectious diseases in the past year	
-None	73 (78.49%)
-Infections	20 (21.51%)
-Infectious diseases (counted)	Average 2.1 time/year
Laboratory results:	
-Blood creatinine (Cr) elevated	54 (58.06%)
-Hematocrit (Hct) (%) elevated (-1)	62 (66.67%)
-Albumin (-1)	30 (32.26%)

Quality of life (from the SF-36 assessment) in all 8 aspects of chronic kidney disease patients undergoing hemodialysis had the following mean and standard deviation values: Physical Functioning had a value of 17.87 ± 5.97, Role-Physical had a value of 4.95 ± 1.43, Bodily Pain had a value of 8.22 ± 2.51, General Health had a value of 14.78 ± 4.76, Vitality had a value of 15.19 ± 3.65, Social Functioning had a value of 7.46 ± 1.88, Role-Emotional had a value of 3.87 ± 1.22, and Mental Health had a value of 21.66 ± 4.74, respectively **(Table 3)**. It was found that physical functioning, physical role, general health, role-emotional. The average value was lower than the median value of the quality of life assessment. Other aspects were found to be higher than the median value of the quality of life assessment **(Figure 2)**. When analyzing the relationship of the 8 factors (Pearson correlation >0.6), it was found that there was a relationship, especially Vitality with General Health and Mental Health, which were highly correlated (0.63 and 0.66, respectively), and Physical Role-Physical with Emotional Role-Emotional, which were highly correlated (0.72). It was found that the quality of Social function had the least relationship with other aspects of quality of life **(Figure 3)**.

Table 3: Results of the quality of life assessment across all eight dimensions (aspects) in 92 chronic kidney disease patients undergoing hemodialysis.

Dimension (aspect):	Mean ± Standard Deviation	Minimum - Maximum Score
A) Physical Functioning	17.87 ± 5.97	10.0-30.0
B) Role-Physical	4.95 ± 1.43	3.0-8.0
C) Bodily Pain	8.22 ± 2.51	1.0-12.0
D) General Health	14.78 ± 4.76	5.0-23.4
E) Vitality	15.19 ± 3.65	8.0-24.0
F) Social Functioning	7.46 ± 1.88	3.0-10.0
G) Role-Emotional	3.87 ± 1.22	0.0.-6.0
H) Mental Health	21.66 ± 4.74	7.0-30.0

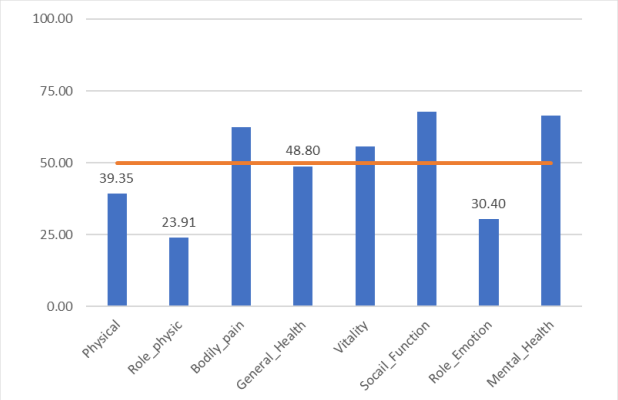

Figure 2: Calculated values for all eight dimensions of quality of life. The possible score ranges from 0 to 100, with a high score indicating a good quality of life (the orange line represents 50 points). In this study, chronic kidney disease patients undergoing hemodialysis had a physical component scale (PCS) score (dimensions A to D: physical functioning, physical role functioning, physical pain, and general health) of 43.59 and a mental component scale (MCS) score (dimensions E to H: vitality, social functioning, emotional role functioning, and mental health) of 55.09 (a healthy Thai population would have scores ranging from 72.5 to 76.1 on the physical component scale and 70.4 to 78.3 on the mental component scale, respectively).

The search for relationships between the 8 dimensions of quality of life and the general condition of the patients found that physical functioning was related to income, receiving EPO, education, alcohol use, and having a caregiver (Figure 4). When considering each factor, it was found that receiving EPO, income, and occupation of the patients were related to quality of life in the dimensions of physical role (Role Physical), mental health (Mental Health), and emotional role (Role Emotional).

The assessment of the 8 dimensions of quality of life (A to H) with laboratory test results showed a moderate relationship (-0.2 to 0.2). It was found that there was a relationship with the laboratory test values of uric acid, sodium, potassium, albumin, total cholesterol test results, and HDL value, as well as the blood test results of Total iron-binding capacity (TIBC). The mental quality of life that was related to the laboratory test values included Total protein, TIBC, and Lab titer levels **(Figure 5)**. The other laboratory test values that were not shown showed a low relationship (less than 0.1 or -0.1) with the studied quality of life.

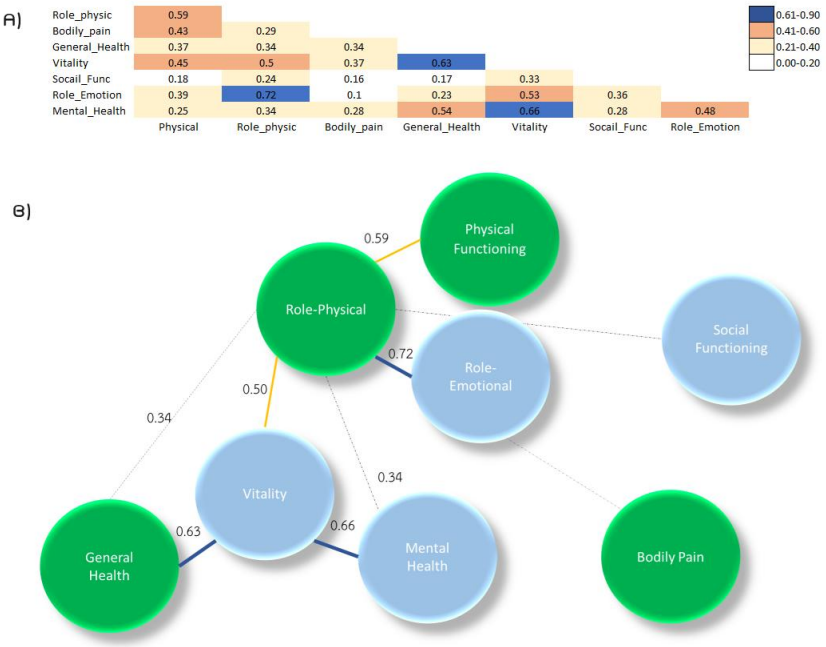

Figure 3. Relationship of quality of life in 8 dimensions. **Top image (A)** Results of the relationship analysis of the 8 assessments. **Bottom image (B)** Visual relationships show relationships in the same direction, especially Vitality with General Health and Mental Health at values of 0.63 and 0.66, respectively, and Role-Physical has a relationship with Role-Emotional at a value of 0.72 (by Person correlation).

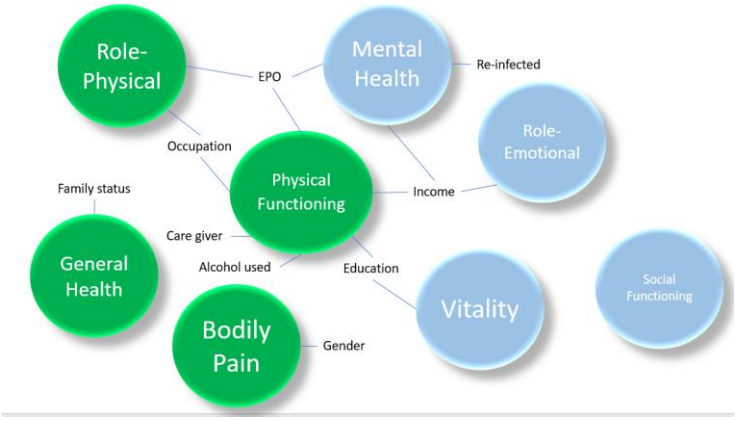

Figure 4: Relationship between general data of chronic kidney disease patients undergoing hemodialysis and the results of the quality of life assessment in all 8 dimensions, namely physical quality of life (A=physical functioning, B=physical role, C=physical pain, D=general health) and mental quality of life (E=vitality, F=social functioning, G=emotional role, H=mental health), respectively (the line showing the connection is a factor with a significant relationship, analyzed with Chi-square statistics at $p<0.05$, in addition, other general data did not show significant differences).

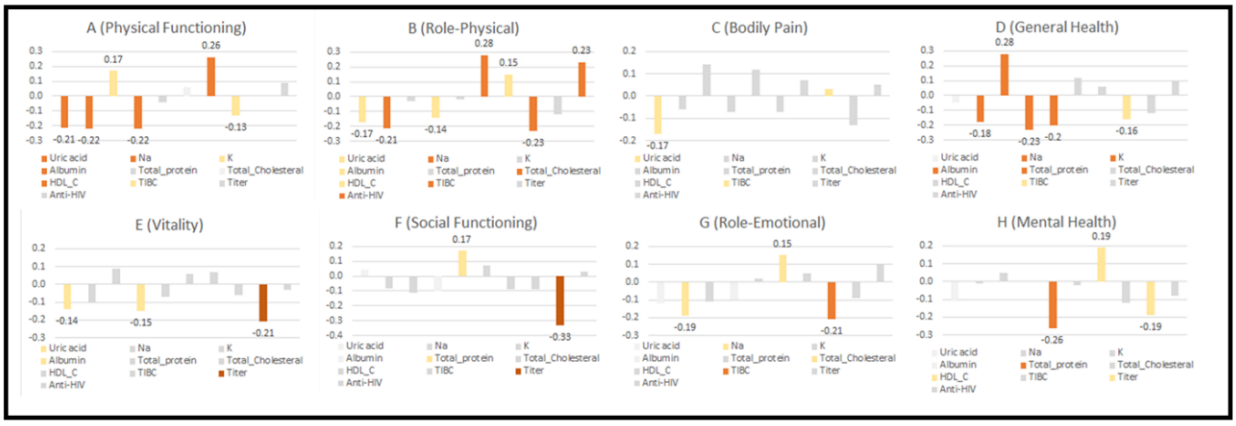

Figure 5: Results of the quality of life assessment in all 8 dimensions (A-H, as shown in Figure 2) that are related to the laboratory test results, showing only the laboratory test results that are found to be related to the quality of life (orange bar graph, from values greater than 0.2 and values less than -0.2 onwards).

Discussions and Conclusion

Quality of Life in Patients with Chronic Kidney Disease (GFR <20% of normal) The patients with kidney disease (GFR <20% of normal) are unable to excrete wastes, water, and electrolytes. This results in weakness, swelling, loss of appetite, nausea, vomiting, and other adverse symptoms. Furthermore, the burden of traveling to the hospital 2-3 times per week and the lengthy duration of each treatment may directly impact the patients' quality of life. Chronic kidney disease patients have a lower quality of life than the general population, consistent with other studies. Analysis of quality of life using the SF-36 questionnaire, divided into physical and mental quality of life, found that the overall average quality of life of chronic kidney disease patients undergoing hemodialysis at the hospital is lower than the normal quality of life reported in the general Thai population. This is consistent with the study by Areewan et al.[12] and lower than a previous study conducted among patients in four hospitals in Kalasin province by Kamolrat et al.[11]. The mean physical quality of life was 52.4 points and the mental quality was 57.1 points. This study found a mean physical quality of life of 45.82 points (normal subjects 72.5-76.1 points) and a mean mental quality of life of 48.18 points (normal subjects 70.4-78.3 points). A Thai study of 152 patients at Siriraj Hospital found that patients with chronic kidney disease receiving renal replacement therapy had a moderate overall quality of life[2]. Furthermore, a study in Selaphum District, Roi-Et province, found that patients with chronic kidney disease receiving renal replacement therapy had a moderate overall quality of life.

However, when considering individual quality of life, it was found to be low and very low[9].

When studying the relationship between various aspects of quality of life in patients with chronic kidney disease, a relationship was found between physical quality of life and mental quality of life. The relationship was particularly strong between vitality and general health, mental health, and physical role. It showed a high correlation between physical involvement and emotional involvement **(Figure 3)**. Chronic kidney disease patients undergoing dialysis reported better outcomes when they felt they could perform well[16]. This is consistent with a corresponding increase in vitality or psychological quality of life. It is possible that social support, such as having a caregiver, has a positive relationship with quality of life in end-stage renal disease patients. Patients with high social support also have a good quality of life[17].

The relationship between other factors on quality of life **(Figure 4)** receiving blood transfusion medications, income, occupation, having a caregiver, and education level consistently predicts self-management behaviors in end-stage renal disease patients receiving treatment at private hospitals. Income, education level, and marital status were found to be positively associated with self-management behaviors[18].

The relationship between a chronic kidney disease patient's history and quality of life, particularly in the physical domain (dimensions A-D), revealed that occupation and having a caregiver were positively associated with physical quality of life. Comorbidities had an inverse effect, decreasing physical role quality of life[1]. In addition, other relevant factors from a chronic kidney disease patient's history also influenced both physical and psychological quality of life. These factors are likely correlated[13], such as age, education, treatment receipt within 1 year, and treatment rights.

This study examined laboratory test results that may be related to the quality of life of patients with chronic kidney disease. It found that laboratory values indicating disease control, such as uric acid[14], sodium, potassium, albumin, total cholesterol, and HDL levels, as well as total iron-binding capacity (TIBC), a protein used to transport iron in the bloodstream, indicate iron deficiency anemia, which can occur during dialysis. This also showed a relationship with physical quality of life (A to D) **(Figure 5)**. This is consistent with some research indicating that hemoglobin and hematocrit values directly affect health scores related to patient quality of life[15] and the use of EPO for red blood cell production[12], which is the standard treatment for patients. Furthermore, laboratory values indicating anemia, such as ferritin (ng/mL) and TSAT (%), were not completely collected in each patient, making interpretation impossible. Laboratory test results that are related to psychological quality of life Potential correlates of these factors include titer, TIBC, and total protein.

This study examined the quality of life in each dimension of chronic kidney disease patients undergoing hemodialysis, which was found to be lower than that of the general population. Factors that may be associated with this quality of life in chronic kidney disease patients receiving hospital treatment were also identified, including past illnesses, caregivers, income, and disease control status, including anemia from hemodialysis. Therefore, interventions that promote good disease control, such as controlling hypertension and diabetes, promoting activities, or having a caregiver during hemodialysis or volunteers to care for patients at home, as well as promoting knowledge and understanding of dialysis practices and anemia, to ensure patients understand and practice them correctly, may improve patients' quality of life, both physically and mentally.

However, this study was a cross-sectional study at any given time. Patients' quality of life may change due to changing factors, such as economic, social, and social conditions, as well as the provision of social support.

Conclusions

The quality of life in chronic kidney disease patients undergoing hemodialysis services in all eight dimensions was lower than the general population's average, consistent with other studies. A relationship was also found between these eight dimensions. Furthermore, the quality of life found was associated with certain patient histories, such as EPO use, income, occupation, education, presence of a caregiver, and past medical history. It was also found to be associated with laboratory test results that reflect disease status or disease control, such as the TIBC blood test.

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