ปัจจัยที่มีอิทธิพลต่อสมรรถนะแห่งตนในผู้ป่วยโรคไตเรื้อรังระยะแรก

Factors Influencing Self-Efficacy of Patients with Early Stages of Chronic Kidney Disease

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บทคัดย่อ

การศึกษาครั้งนี้มีวัตถุประสงค์เพื่อทดสอบอิทธิพลของปัจจัยการทำหน้าที่ของครอบครัวและปัจจัยความฉลาดทางสุขภาพต่อสมรรถนะแห่งตนของผู้ป่วยไตเรื้อรังระยะแรก กลุ่มตัวอย่างการวิจัยเป็นผู้ป่วยไตเรื้อรังระยะแรกที่มีค่าอัตราการกรองของไตระหว่าง 31 ถึง 90 ml/min/1.73 m2 จำนวน 275 คน โดยวิธีการสุ่มตัวอย่างแบบแบ่งกลุ่ม การรวบรวมข้อมูลใช้แบบสอบถามที่ให้กลุ่มตัวอย่างเป็นผู้ตอบเอง ได้แก่แบบสอบถามข้อมูลส่วนตัว แบบวัดสมรรถนะแห่งตนในผู้ป่วยโรคไตเรื้อรังระยะแรก แบบวัดความฉลาดทางสุขภาพและแบบวัดการทำหน้าที่ของครอบครัว แต่ละแบบวัดมีค่าความเชื่อมั่นครอนบาคเท่ากับ .95, .80, and .83 ตามลำดับ การวิเคราะห์ข้อมูลใช้สถิติเชิงพรรณนาและการวิเคราะห์การถดถอยพหุคูณ ผลการวิจัยพบว่าการทำหน้าที่ของครอบครัวและความฉลาดทางสุขภาพ มีอิทธิพลทางบวกต่อสมรรถนะแห่งตนในผู้ป่วยโรคไตเรื้อรังระยะแรก ซึ่งสามารถอธิบายความแปรปรวนได้ร้อยละ 54 โดยการทำหน้าที่ของครอบครัวและความฉลาดทางสุขภาพ มีอิทธิพลโดยตรงทางบวกต่อสมรรถนะแห่งตนในผู้ป่วยโรคไตเรื้อรังระยะแรกอย่างมีนัยสำคัญทางสถิติ ($p < .05$)

คำสำคัญ : สมรรถนะแห่งตนของโรคไตเรื้อรัง โรคไตเรื้อรังระยะแรก การทำหน้าที่ของครอบครัว ความฉลาดทางสุขภาพ

Abstract

The purpose of this study was to examine the effect of family functioning and health literacy on CKD self-efficacy among patients with early stages of CKD. The research samples were 275 patients who had an estimated glomerular filtration rate (eGFR) between 31 and 90 ml/min/1.73 m2. A cluster random sampling technique was used to obtain the participants. For research materials, four self-administered questionnaires including demographic data form, CKD Self-Efficacy Health Literacy Scale-14, and Chulalongkorn Family Inventory were used to collect the data. Their Cronbach's alpha reliabilities were .95, .80, and .83, respectively. The data were analyzed by using descriptive statistics and multiple regression at statistical significance level, $p < .05$. The result showed that family functioning and health literacy had direct positive effects on self-efficacy. Moreover, family functioning and health literacy explained 54% of total variance in self-efficacy among patients with early stage of chronic kidney disease.

Keywords : CKD Self-Efficacy, Early stages of CKD, Family Functioning, Health Literacy

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Introduction

The conditions from Chronic Kidney Disease (CKD) develop slowly and worsen over time. CKD can be classified as presenting five stages of pathology with no symptoms during stages1, 2 and 3, defined as early stage. At stage 4, the patient perceives symptoms such as fatigue, muscle weakness and restless legs. The last stage of CKD or stage 5 presents severe illness with fluid overload, uremic problems with increased risk of morbidity and is treated by renal replacement therapy (RRT). RRT contains three modalities including peritoneal dialysis (PD), hemodialysis (HD) and kidney transplantation (KT). In 2007, Nephrology Society of Thailand reported that the patients who need treated by RRT 419.9 case per one million population, and increase to 905.9 case per one million population in 2012.[1] Thus, the slow progression of CKD is challenging for patients at early stages of the disease.

The national clinical guidelines are now available to manage CKD for slow progression. Patients with early stages CKD should be managed following the clinical guidelines The recommendations relevant to life style modifications include cessation of smoking, reduction of alcohol consumption, exercise between 30 to 60 minutes 4-7days a week, control protein intake to less than 0.80 - 1.0 g/kg./d, control of body mass index to less than 25 kg/m², and limit sodium intake 2 gm/ day.[2, 3] Due to lack of symptoms during early stages of CKD, patients are often not confident to perform self-management as the recommended clinical guidelines.

Self-efficacy is a factor that engages self-management behaviors. Bandura[4] demonstrated the self-efficacy helps persons gain a sense of confidence in their ability to overcome barriers. However, patients who had self-efficacy should perform self-management behaviors while being asymptomatic at early stages of CKD. Previous studies have indicated that patients with higher self-efficacy have better self-management, such as adherence to therapeutic or medication regimen, performance of recommended self-care activities,[5] build-up the individual's ability to complete day-to-day tasks and positively correlated with self-management.[6] self-efficacy prevent worsening of the illness.[7] Therefore, self-efficacy need to be encouraged for self-management behaviors to delay progression of CKD.

Based on a review of literature of both quantitative and qualitative researches, several factors influence persons' self-efficacy such as family functioning and health literacy. First, family functioning appears to be related to family systems typically by appraising, operating and behaving that influence the health activities of family members. The family members encourage patients with CKD to complete day-to-day tasks such as controlling blood pressure, maintaining low salt and low protein diets and building a sense of confidence to strengthen CKD self-efficacy.[4] Second, health literacy is the ability of individuals to gain access to knowledge and use information in ways which promote and maintain good health.[8] It plays an important role in making informed decisions and behavioral changes; health behaviors are also influenced by psychosocial attributes, such as self-efficacy.[9] To improve self-efficacy in patients with early stages of CKD, this study, thus, was designed to explore the prevalence and impact of self-efficacy among these patients and investigate the contribution of health literacy and family function in patients with early stage of CKD.

Literature review

Self-efficacy refers to people's beliefs about their capability to control the events affecting their lives. It is the ability to organize and execute the courses of action required to manage prospective situations. It is concerned with judgment about what

one can do with whatever skills one possesses and has a complex effect on task performance.[4] Also, It is defined as a person's own judgment of capabilities to perform a certain activity to attain a certain outcome.[10] In the area of CKD, much research has indicated the relationship of self-efficacy and self-management. Lin et al.5 studied in 594 CKD patients at early stages of CKD. They found that self-efficacy had a positive relationship with self-management. The CKD self-efficacy identified four observed variables including autonomy, self-integration, problem-solving and seeking social support contributing to about 64.35% of the total variance. Moreover, Kack[11] studied in 132 CKD patients going through the process of renal replacement therapy. The findings explained that 51% of the variance was involved in the maximum activity score. Moreover, age, self-efficacy and serum albumin level explained 59% of the variance in the adjusted activity. CKD self-efficacy improved the outcomes through the application of self-management behaviors designed to prevent worsening of the illness,[7] In addition, family and friends support, accounting for 4.79% of the variance, significantly increased CKD self-efficacy.[5]

Health literacy is the cognitive and social skills which determine the motivation and ability of individuals to gain access to, understand and use information in ways which promote and maintain good health.[12] Health literacy is necessary to make decisions about health behaviors by following CKD guidelines and is influenced by psychosocial attributes that contribute to self-efficacy.9 Several research studies have shown self-efficacy was a partial mediator between health literacy and self-care behaviors (β = .32, CI: 0.11- 0.60) among patients with CKD who underwent kidney transplant.[13] Similarly, Wu6 studied in patients with CKD stages 1 to 5 and found the relationship between knowledge and self-care was fully mediated by self-efficacy ($z = 4.82$, $p < .001$) at a 50% level of effect. Knowledge in Wu's study was related to health literacy and self-care as part of self-management behaviors. Also, illness perception was correlated with self-efficacy, because patients perceived the complexity of CKD and were able to organize CKD guideline activities. It was also associated with increased self-confidence and more fully developed self-efficacy.

Family functioning is a unit necessary to changes in responsible assignments, interaction patterns and problem solving. It involves an instrumental unit that supplies basic needs of its members such as food, cleanliness, lodging and play. It also involves an economic unit where economic resources are shared among family members. Generally, family functioning is often used as an umbrella term encompassing numerous constructs, including family problem solving skills, communication, roles, affective responses, affective involvement, behavioral control and general functions.[14] Because family functioning represents a unit, a chronic illness is one aspect of functioning that will influence both the family members and the individual patient. In addition, family as the environment reduces stresses by interactions between family and family members through daily activity, like social support.[15] Moreover, family encourages CKD patients to complete a day-to-day task such as controlling blood pressure, taking low salt and low protein diets and so on. That is sense of confidence may build up CKD self-efficacy appearance. The studies of family functioning in early stages of CKD are limited. Prior evidence has demonstrated the family functioning relationship with self-management behavior in chronic illness. Stubbs et al.[16] found family functioning model significantly predicted academic self-efficacy and school engagement.

In summary, it is therefore reasonable to

propose that family functioning and health literacy have a direct positive effect on self-efficacy.

Research objective

The aim of this study was to examine the effect of family functioning and health literacy on self-efficacy among patients with early stages of CKD.

Design

A descriptive correlation, cross-sectional design was used

Methods

Population and Sample

Participants were persons who had estimated glomerular filtration rates (eGFR) from 31 to 90 ml/min/1.73 m² for at least one month, aged 20 to 65 years, no kidney tumor, no kidney infection, no SLE (Systemic Lupus Erythematosus) and had agreed to participate. The previous study had been conducted in 216 cases of early stage CKD.[17] In this study, the data were collected from 275 cases.

Sampling technique

A cluster random sampling technique was used to obtain the subjects because the population having an eGFR from 31 to 90 ml/min/1.73 m^2 did not include all patients in the hospital. Moreover, early stage CKD does not present symptoms, so screening by eGFR was helpful. A tertiary hospital typically uses eGFR to monitor CKD among high risk cases such as patients with diabetes and hypertension. Therefore, the research setting comprised 10 tertiary hospitals in Bangkok. The simple random sampling was used to select eligible subjects at the Nephrology Clinic of Bhumibol Adulyadej hospital and Rajavithi hospital.

Ethical Considerations

The study was approved by the research ethics committees of IRB (Approval number 073/2559). The informed consent form was explained including the purpose, benefits, risks, types of questionnaires, time and tasks to be completed. At the hospital, the participants were asked to sign a consent form, and were informed of their right to withdraw from the study at any time. Their names were not used in data; instead, a code number was used to ensure confidentiality.

Instruments

The four instruments used in this study are described below.

1. Personal data form

The personal data form comprised of sex, age, education level, smoking, drinking, blood pressure, level of eGFR, comorbid disease and family history of CKD and family members.

2. CKD Self-Efficacy (CKD-SE) Questionnaire

The CKD-SE was used to measure CKD self-efficacy. Lin et al.[5] reviewed relevant published literature and developed, based on self-efficacy theory 4 and back translation process into Thai. It has four subscales including 1) autonomy, 2) self-integration, 3) problem-solving and 4) seeking social support. The CKD-SE is a 25-item self-administered scale that measures subjects' confidence. The scale of the instrument ranged from no confidence (0) to the highest degree of confidence (10). The possible scores ranged from 0 to 250 points, with higher scores indicating greater levels of confidence. Cronbach's alpha coefficient for the CKD-SE was .94 and each of the four subscales was reported as .895, .901, .877, and. 843, respectively.[5] It indicated good internal consistency for this newly constructed instrument. Cronbach's alpha coefficient for internal reliability for this study was .95.

3. Health Literacy Scale-14 (HLS-14)

The HLS-14 was used to measure health literacy. This instrument was developed by Suka et al.,[18] and back translation process into Thai. It contains five items pertaining to functional health literacy, five items pertaining to communicative health literacy and four items pertaining to critical health literacy.

It comprises of 14 items on a 5-point Likert scale indicating how much the respondent agrees or disagrees with the item from "strongly disagree" to "strongly agree". Higher scores indicate better health literacy. Cronbach's alpha indicated satisfactory internal consistency of functional, communicative and critical health literacy and total health literacy scores of .83, .85, .76, and .81, respectively.[18] Cronbach's alpha coefficient for internal reliability for this study was .80.

4. Chulalongkorn Family Inventory (CFI)

The CFI was used to measure family functioning. The instrument was originally written in Thai and developed by Trangkasombat[14] based on the Mc Master family model. The current study assessed CKD at early stages. CFI was modified by deducing problem solving subscales because early stage CKD does not threaten the integrity and functional capacity of the family. Therefore, the current study was modified by excluding problem solving, affective involvement and general functioning subscales. Cronbach's alpha coefficient for internal reliability for this study was .83.

Data collection

After obtaining permission from IRB, the researcher made appointments with physicians and nurses at nephrology clinic in the hospital settings, informed them about the objectives and process of the study and asked for their cooperation. The researcher selected the eligible participants in each hospital setting. Before data collection, the eligible participants were given an explanation of the research purpose, process of study, risks and benefits of the study and their rights to participate, then were asked to sign consent form. The participants were self-administered the questionnaire whichtook approximately 30 to 45 minutes to complete.

Data analyses

Descriptive statistics were used to determine patients' characteristics, CKD self-efficacy, family functioning, and health literacy. Pearson's correlation was used to describe the bivariate relationships. The statistical assumption of normal distribution was examined prior to the multiple regression analysis. The significance level was set at. 05.

Result

The sample included 275 patients at early stages of CKD, demographic characteristics are presented in Table 1. Over one-half were male (60%). The majority of patients with CKD in this group were at stage 3 (70.2%), the remaining were at stage 2 (22.5%) and 1 (7.6%). More than 70% were aged 51 to 65 years old. Most sample (68%) had obtained education below bachelor's degree, while the rest obtained bachelor's degree (25.8 %) and higher than bachelor's degree (6.2 %). Only 10.5% smoked and 14.9% consumed alcohol. One half had blood pressure over 131/81 mmHg ranging from 131/81 to 140/90 mmHg (30.9%) and those presenting more than 141/90 mmHg accounted for 23.6%. On the other hand, blood pressure less than 121/70 mmHg totaled 16.7% and ranged from 121/70 to 130/80 mmHg (28.7%). About 85% of the sample had comorbidities and hypertension was the highest (36.7%), followed by having both diabetes and hypertension (29.5%), diabetes (11.6%) and others such as gout and cancer (6.9%). Only 19% of the patients had CKD among family members, as presented in table 1

In terms of descriptive statistics of the variables in this study, the total score of family functioning ranged from 39 to 68 (M = 54.1, SD = 5.39), health literacy ranged from 30 to 70 (M = 51.57, SD. = 7.30), and CKD self-efficacy ranged from 87 to

Table 1 Demographic characteristics of sample (n = 275)

Demographic characteristics	frequency	%
Sex - Female	110	40
- Male	165	60
Stage of chronic kidney disease		
- Stage 1 (GFR >90)	5	1.8
- Stage 2 (GFR= 60–89)	124	45.1
- Stage 3 (GFR=30–59)	146	53.1
Age - 20 – 35 years	21	7.6
- 36 – 50 years	61	22.5
- 51 – 65 years	193	70.2
Education level - Lower bachelors degree	187	68
- Bachelors degree	71	25.8
- Over bachelors degree	17	6.2
Blood pressure level - < 120/70 mmHg.	46	16.7
- 121/71 - 130/80 mmHg.	79	28.7
- 131/ 81- 140/100 mmHg.	85	30.9
- > 141/101 mmHg.	65	23.6
Comorbidity conditions - No	42	15.3
- Yes : Diabetics	32	11.6
: Hypertension	101	36.7
: Diabetic and hypertension	81	29.5
: Other:	19	6.9

Table 2 Descriptive statistics of the study variables (n = 275)

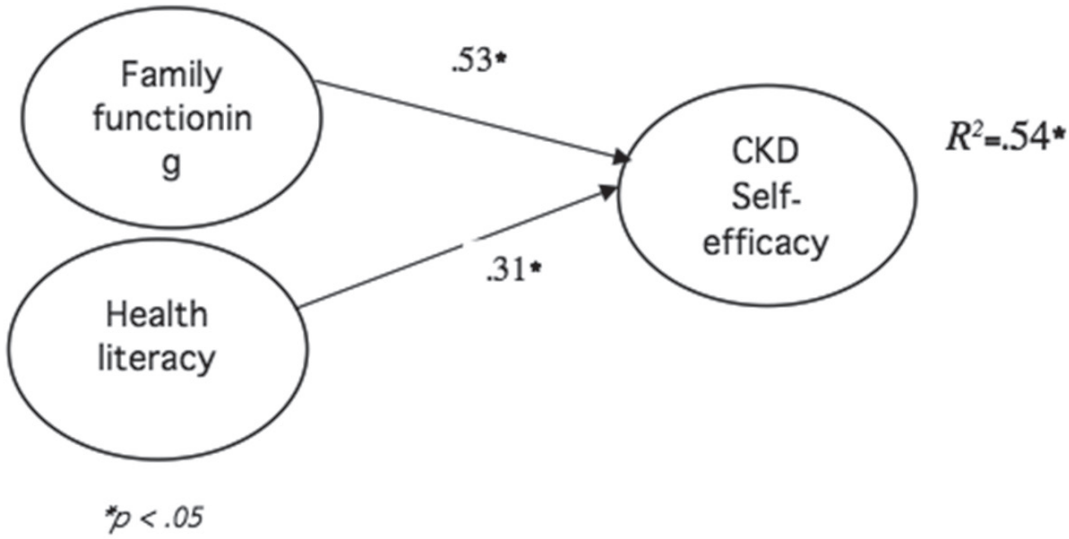
Variable	Possibl range	Actual range	Mean	SD.
Family functioning	17 - 68	39 - 68	54.10	5.39
Health literacy	14 - 70	30 - 70	51.57	7.30
CKD self-efficacy	0 - 250	87 - 250	190.62	33.51

Table 3 Correlation Matrix of the Study Variables (n = 275)

Variable	CKD self-efficacy	Family functioning	Health literacy
CKD self-efficacy	1.00		
Family functioning	.342**	1.00	
Health literacy	.448**	.182**	1.00

**p < .01

Figure 1 Path diagram of health literacy and family functioning on CKD self-efficacy on patients with early stage of CKD (n = 275)



250 (M = 190.62, SD= 33.51). The result of variables reported family functioning and health literacy with a mean of each variable higher than one half of the possible range. The mean score of CKD self-efficacy was 190.62, higher than one half of the possible range, as presented in table 2.

Table 3 presents strength of correlation coefficients between dependent variable and each independent variable. The self-efficacy was associated with health literacy and family functioning. In the modified model, the significant parameter estimates from family function to self-efficacy were in a positive direction (β = .53, p < .05). Health literacy had a positive direct effect to CKD self-efficacy (β = .31, p < .05). Moreover, family functioning and health literacy accounted for 54% (R^2 = .54) of the variance in self-efficacy, presented in Figure 1.

Discussion

The findings provide the context of a causal relationship between the significant predictors and self-efficacy among patients at early stages of CKD. The discussion the result presents the path coefficients of health literacy had a positive direct effect on self-efficacy (β = .31, p <.05). It could imply that patients at early stage CKD acquire health literacy that influences increased CKD self-efficacy. That is, patients who have confidence should understand and be able to organize health behaviors. This finding was consistent with Sritarapipat et al.[17] who studied elderly patients with CKD and found health literacy affected self-efficacy. Moreover, Thompson[19] found that health literacy accounted for 3% of the variance in self-efficacy among patients with diabetes

Family functioning had the strongest positive direct effect on CKD self-efficacy (β = .53, p <.05), the family as a unit must respond to necessary changes in responsibilities assigned, interaction patterns and problem solving. Family functioning involves interactions among CKD patients and family members through daily activity support. These experiences provide crucial self-efficacy and affects social relationships exemplified even in social support. In Thai culture, people usually live with their family

as an extended family unit. These relationships provide them the opportunity to gain self-efficacy and social support through interactive family functioning.

In conclusion, the variables representing family functioning and health literacy explained about 54% of the variance in self-efficacy. The estimated parameter from health literacy to self-efficacy had a significant positive direct effect. The estimated parameter from family functioning to self-efficacy had a significant positive direct effect. This study proved self-efficacy among patients at early stage CKD need personal intellectual and family facilitation. Health literacy is of paramount importance as it relates to cognitive faculty to arrange healthy situations and adhere to recommended activities and appropriate diet for patients with CKD. Also, family functioning enhances patients' capacities.

Implications and Recommendations

The finding might be used to guide nursing interventions. Patients at early stage CKD are able to promote CKD self-efficacy through health literacy and family functioning. Professional nurses can identify areas of concern related to these factors. The nursing care should focus on individual intellectual activities related to health literacy. They could assist patients in understanding of CKD clinical guideline for slow progression of disease. Moreover, family functioning would be bear and support associated with increased CKD self-efficacy. In addition, future studies would be of interest to program relate to health literacy and family functioning for promote self-efficacy in other area.

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