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Risk Perceptions toward Chronic Kidney Disease and Self-Care Behaviour among People with Type 2 Diabetes Mellitus Attending Follow-Ups in the Tertiary Care Hospitals

Vannasith Phonlevong[1*], Xayphasith Vollasin[1], Jonhly Penthady[1], Khamthavisouk Detthasack[1], Latsamee Oulay[1], Khamtim Samountry[1], Orapin Laosee[2], Piyapong Janmaimool[2], Cheerawit Rattanapan[2]

[1]Faculty of Public Health, University of Health Sciences, Vientiane, Lao
[2]ASEAN Institute for Health Development, Mahidol University, Nakhon Pathom, Thailand
Email: *phonlevongvannasith@gmail.com

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Abstract

Diabetes mellitus (DM) is the second leading cause worldwide of chronic kidney disease (CKD) and CKD-related mortality. Previous reports indicated an increased risk of CKD in the Lao PDR due to poor diet and poor physical activity. There was an increase in the number of CKD patients, from 4.24% in 2020 to 8.55% in 2022. This cross-sectional study aims to examine factors in self-care behaviour among people with type 2 DM who visited three tertiary care hospitals in Lao PDR. The study was conducted at the OPD of these hospitals. Face-to-face interviews were used to collect the information using structured questionnaires from September to October 2024. A total of 422 subjects completed this study. Descriptive and multiple logistic regression were used to analyse the data. Only 41% of respondents demonstrated good self-care behaviours. Those who were underweight and normal BMI (AOR: 1.72, 95% CI: 1.12 - 2.65), less knowledge of self-care practices (AOR: 0.49, 95% CI: 0.26 - 0.93), high perceived severity of CKD (AOR: 2.03, 95% CI: 1.32 - 3.14), low perceived barriers to performing self-care practices (AOR: 1.71, 95% CI: 1.09 - 2.69).

Subject Areas

Diabetes & Endocrinology

Keywords

Risk Perception, Chronic Kidney Disease, Type 2 Diabetes Mellitus, Obesity, Lao PDR

1. Introduction

Diabetes mellitus (DM) is a metabolic disease with a variety of etiologies that is distinguished by persistent hyperglycaemia and abnormalities in the metabolism of fat and carbohydrates. It is caused by a malfunction in the production of insulin, the action of insulin or both and over time, it causes major damage to several organs [1]. DM, especially Type 2 DM, is the second leading cause of chronic kidney disease (CKD) worldwide [2] when DM patients do not perform good self-care behaviour. CKD is expected to increase from 10% in 2022 to 12.0% in 2030 and 13.8% in 2045, with 95% of cases residing in low- and middle-income countries [3] [4]. In the Lao PDR, 8.55% of the population had CKD in 2022 [5]. An increased risk of complications, including diabetic nephropathy, diabetic neuropathy and heart disease, stroke, amputation of a leg, and death, can result from poorly treated Type 2 DM [6]. Delaying the progression of diabetes can lead to improved health and economic outcomes for patients, society and the healthcare system [3] [5].

Several studies have shown a clinically significant correlation between self-care behaviour and haemoglobin A1c control, which is important for attaining diabetes-related beneficial health outcomes [7]. To maintain optimal haemoglobin A1c control, the patient must adhere to a healthy diet, regular physical activity, blood glucose monitoring and treatment regimen. These self-care behaviours are crucial for efficient Type 2 DM control [8] [9]. Achieving glucose control is difficult and complex because it is affected by several clinical, psychological, and sociodemographic variables [8]. Therefore, factors associated with poor glycaemia control should be identified by combining such factors, including time spent on self-care behaviour. Moreover, self-care behaviour significantly affects the knowledge related to the risk of CKD control [10]. In addition, the risk perception toward CKD was significantly affected by various sociodemographics, perceptions toward the risk of CKD, clinical measurement, and medication-related characteristics [11]. Low knowledge is associated with low income, low education level, and unemployment [12] [13]. Obesity, longer duration of diabetes, and high perceived barriers to performing self-care practices were significantly associated with poor self-care practices [5] and inadequate self-care behaviour.

The Laotian literature has shown self-care behaviour and risk perception toward CKD in Type 2 DM patients [14]. However, poor self-care practices and glycaemic control in Laotian patients with Type 2 DM cause kidney failure. Additionally, while previous research on self-care behaviours used validated tools from outside the Lao PDR, the current study utilised tools that were locally validated to measure self-care behaviours in individuals with Type 2 DM. Therefore, this study evaluated the association between risk perception of CKD and self-care behaviour among people with Type 2 DM in selected Vientiane capital public tertiary hospitals. Identifying the contribution of each self-care behaviour toward glycaemic control among people with Type 2 DM is especially useful in policymaking and prioritising diabetes self-care intervention to enhance glycated haemoglobin A1c

control.

2. Materials and Methods

2.1. Study Design and Participants

This study was a cross-sectional design to investigate the protective measures and risk perceptions of CKD and self-care behaviours among people diagnosed with Type 2 DM in Vientiane capital Lao PDR.

Study area, data collection from three public tertiary hospitals among people diagnosed with Type 2 DM in Vientiane capital Laos. A quantitative face-to-face interview was conducted using a questionnaire featuring closed-ended questions. This study included Lao citizens aged 18 years and above, who have been diagnosed with Type 2 DM for at least one year, currently living in Vientiane's capital and have visited the three public tertiary care hospitals. However, individuals who are not available and those who refuse to participate at the time of the interview period are excluded.

This study used a multi-stage sampling method across three public tertiary hospitals in the capital of Vientiane, Laos. The hospitals included Mahosot Hospital, Setthatthirath Hospital and Mitthaphab Hospital. There were 211, 127 and 84 participants from Mahosot Hospital, Setthathirath Hospital, and Mitthaphab Hospital, respectively. The number of cases was proportionally allocated to each hospital, and a systematic random sampling method was used to select Type 2 DM patients. Data collection was conducted using a combination of simple random sampling and proportional-to-size sampling.

2.2. Research Instrument

A quantitative face-to-face interview questionnaire with closed-ended questions was used to collect data. This standardized instrument is similar to those used in previous research that examined the risk perception of CKD and self-care behaviours among individuals diagnosed with Type 2 DM. The questionnaire comprised five sections, with a total of 50 items, of which five were completed by a research assistant using information from medical records, which included age (18 - 45 years, 46 - 60 years vs ≥ 61 years) sex (male vs female), occupation (civil servant vs retired/unemployed), family history of CKD (grandparents vs parents), knowledge related to the risk of CKD (yes vs no), perception towards the risk of CKD (strongly agree vs strongly disagree) and clinical measurement (poor vs good) were the independent variables. As for self-care behaviour categorized into drug adherence, diet, and individual lifestyle are classified as never to always (poor vs good).

Validity was refined based on previously utilized questionnaires and operational definitions were crafted using structured formats. Initially composed in English, the questions were subsequently translated into the local language and validated by an expert. A reliability test was conducted through a pilot test study involving 30 individuals from both the outpatient and inpatient departments of

diabetes at the military hospital. These individuals displayed varying levels of risk perception regarding CKD and self-care behaviour. The reliability scores, measured using Cronbach's Alpha, ranged from 0.75 to 0.86.

To streamline the data collection process, IRB approval was requested from three public tertiary care hospitals involved in this study. Trained research assistants and data collectors introduced themselves and explained the purpose of the study to the respondents. Participants were also assured that their responses would be kept confidential. The researcher and the data collectors reviewed the statements in the consent form and obtained written consent from the participants. If the participants agreed to participate in the interview, it was conducted using a standard questionnaire designed to last no longer than 20 minutes. The researcher and data collectors ensured that participants understood they had the right to withdraw from the interview at any time if they felt uncomfortable.

2.3. Data Analysis

The statistical analysis was carried out using IBM Statistical Package for Social Science (SPSS) software, version 25. The data collected were analysed descriptively, focusing on frequency, percentage, median, quartile deviation, minimum, and maximum. The descriptive statistical analysis explored the relationship between risk perception of CKD and self-care behaviour, including socio-demographic factors, knowledge related to CKD, perceptions toward the risk of CKD, and clinical measurements using the chi-square test, binary logistic regression and multiple logistic regression. Before carrying out the multivariate analysis, the researcher checked for multicollinearity among the variables using the Spearman rank correlation test.

Before administering any questionnaires for face-to-face interviews, the researcher sought ethical approval for the whole study and its instruments. The study was approved by the ethics review committee, obtained from the Ministry of Health, University of Health Sciences Research Ethics Committee No: 848/REC. A certificate of ethics review approval was issued, and comprehensive information regarding the study objectives, methods, potential risks, harm and benefits and ways to contact the research team was provided to respondents before the interview. Informed consent was obtained from all participants before taking part in the survey, and participation was entirely voluntary.

3. Results and Discussion

The characteristics of 422 individuals who participated in this study are shown in Table 1. The result showed that 67.0% of participants were female, and the majority were of working age, ranging from 25 - 89 years, with a median age of 58. The largest group was 46 - 60 years old, and 26.6% completed at least primary school level education. Notably, 13.4% had attained a university-level education or higher. Additionally, approximately 32.3% of the respondents were either retired or unemployed. The reported median monthly income was 2,800,000 LAK,

with 49.9% earning above the median. Approximately USD 127 at the time of data collection [15]. About 9.0% of participants reported having more than five million kips of monthly income. Of those participants, 71.6 % lived in urban areas. 36.7% of respondents were civil servants and had health insurance coverage. The majority (87.5%) utilised outpatient department services. Most participants (90.3%) indicated there was no family history of CKD. Notably, 8.8% of those with a known familial history of CKD were from their parents. More than half (64.7%) of participants living with Type 2 DM at less than or equal to nine years, and 43.6% of respondents were obese.

Table 1. Frequency and percentage of sociodemographic characteristics.

Socio-demographic characteristics	Frequency (n)	Percentage (%)
Sex		
Male	143	33
Female	290	67
Age group (years)		
18 - 45	64	14.8
46 - 60	194	44.8
≥61	175	40.4
(Median 58; QD 14; Min-Max 25-89)		
Education level		
Illiterate	21	4.8
Primary school	115	26.6
Lower secondary school	98	22.6
Upper secondary school	59	13.6
Tertiary/College	82	18.9
University	58	13.4
Occupation		
Civil servant	70	16.2
Farmer	34	7.9
Labour	20	4.6
Merchant	74	17.1
Unemployed	95	21.9
Retired	140	32.3

Continued

Income level		
100,000 - 2000,000 LAK (USD 4.6-91)	178	41.1
2,100,000 - 5,000,000 LAK (USD 96-228)	216	49.9
>5,000,000 LAK (USD >228)	39	9
(Median 2,800,000; QD 2,000,000; Min-Max 100,000 - 13,000,000)		
Living area		
Urban	310	71.6
Rural	123	28.4
Type of health insurance		
Uninsured	123	28.4
Private insurance	117	27
Civil servants	159	36.7
Enterprises	9	2.1
CBHI	25	5.8
Department		
OPD	379	87.5
IPD	54	12.5
Family history of CKD		
No	391	90.3
Yes	42	9.7
If yes, who had been CKD		
Grandparents	4	0.9
Parents	38	8.8
Duration of Type 2 DM (Years)		
≤9	280	64.7
>10	153	35.3
BMI (kg/m^2)		
Underweight (<18.5)	26	6
Normal (18.5 - 22.9)	120	27.7
Overweight (23 - 24.9)	98	22.6
Obese (≥25)	189	43.6
(Median 24.5; QD 5.25; Min-Max 8.4 - 41.4)		

The result shows that the proportion of respondents demonstrating good self-care behaviour was significant among those without family history members with CKD (37.1%) of participants, compared with those with family history members of CKD (16.7%) of participants, and 44.5% of respondents with underweight or normal BMI demonstrating good self-care behaviour compared to those overweight or obese. A significant association was found between the knowledge of self-care practices and self-care behaviours. The proportion of respondents demonstrating good self-care behaviour was 37.8%, and 21.1% among those with low and high self-care practices, respectively (p-value = 0.01). The results were found between the perceived severity of CKD and self-care behaviours. The proportion of respondents demonstrating good self-care behaviour was 29.6% and 40.5% among those with perceived low and high severity of CKD, respectively (p-value = 0.02). The perceived barrier to performing self-care practices and self-care behaviour. The proportion of respondents demonstrating good self-care behaviour was 39.7% and 26.5% among those with perceived barriers, low and high barriers to performing self-care practices, respectively (p-value = 0.08) as shown in Table 2.

Table 2. Characteristics of respondents based on self-care behaviour.

Characteristics	Poor self-care behaviour	Good self-care behaviour
	n (%)	n (%)
Sex		
Male	99 (69.2)	44 (30.8)
Female	182 (62.8)	108 (37.2)
Age group (years)		
18 - 59	154 (65.5)	81 (34.5)
≥60	127 (64.1)	71 (35.9)
(Median 58; QD 6.25; Min-Max 25 - 89)		
Occupation		
Civil servant/Farmer/Laboure/Merchant	164 (69.8)	71 (30.2)
Retired/Unemployed	117 (59.1)	81 (40.9)
Family history of CKD		
No	246 (62.9)	145 (37.1)
Yes	35 (83.3)	7 (16.7)
BMI (kg/m^2)		
Underweight/Normal	81 (55.5)	65 (44.5)
Overweight/Obese	200 (69.7)	87 (30.3)

Continued

Knowledge related to self-care practices		
Low	225 (62.2)	137 (37.8)
High	56 (78.9)	15 (21.1)
Perceived of the severity of CKD		
Low	150 (70.4)	63 (29.6)
High	131 (59.5)	89 (40.5)
Perceived barriers to performing self-care practices		
Low	170 (60.3)	112 (39.7)
High	111 (73.5)	40 (26.5)

Association between Factors and Self-Care Behaviours

Binary logistic regression analysis examined the association between socio-demographic characteristics and self-care behaviour. The results indicated that self-care behaviours had a significant association with occupation (COR: 1.59, 95% 1.07 - 2.37). Those working, such as farmers/labourers/ merchants and civil servants, were 1.59 times more likely to perform good self-care behaviours compared to those who were retired or unemployed. Additionally, the findings indicated a significant association was observed for the BMI respondents, with underweight and normal were 1.84 times more likely to perform good self-care behaviour compared to those who were overweight or obese (COR: 1.84; 95% CI: 1.22 - 2.78). individuals with self-care practices were 21.1% less likely to perform self-care behaviour than people with no self-care practices. Regarding perceptions toward the risk of CKD and self-care behaviours, a statistically significant association was observed for the perceived severity of CKD. The respondents with a high perception of the severity of CKD were 1.61 times more likely to perform good self-care behaviour compared to those with a low perception of the severity of CKD (COR: 1.61, 95% CI: 1.08 - 2.41). Moreover, the low perceived barriers to performing self-care practices were 1.82 times more likely to perform good self-care behaviour compared to those with high perceived barriers to performing self-care practices (COR: 1.82, 95% CI: 1.18 - 2.81). as shown in Table 3.

Multivariate logistic regression. Independent variables with a p-value < 0.25 from the binary logistic regression analysis were utilised to assess their predictive ability in the multiple logistic regression analysis. The results indicated that those who were underweight and had normal BMI were 1.72 times more likely to perform good self-care behaviour than those who were overweight and obese (AOR: 1.72, 95% CI: 1.12 - 2.64). Respondents, with knowledge of self-care practices, were 21.1% less likely to perform self-care behaviour than people with no self-care practices (AOR: 0.49, 95% CI: 0.26 - 0.93). Additionally, those who high perceived

severity of CKD were 2.03 times more likely to perform good self-care behaviour than those who low perceived severity of CKD (AOR: 2.03, 95% CI: 1.32 - 3.14). Furthermore, perception, respondents who had low perceived barriers to performing self-care practices were 1.71 times more likely to perform good self-care behaviour than those who perceived high barriers to performing self-care practices (AOR: 1.71, 95% CI: 1.09 - 2.69).

Table 3. Bivariate and multivariable analysis based on self-care behaviour.

Characteristics	Bivariate analysis		Multivariable analysis	
	COR (95%CI)	p-value	AOR (95%CI)	p-value
Occupation				
Farmer/Laboure/Marchant/ Civil servant	1.59 (1.07 - 2.37)	0.021	1.42 (0.94 - 2.16)	0.093
Retired/Unemployed	1		1	
BMI (kg/m^2)				
Underweight/Normal	1.84 (1.22 - 2.78)	0.004	1.72 (1.12 - 2.64)	0.013
Overweight/Obese	1		1	
Duration of Type 2 DM (years)				
<5	1		1	
≥5	0.73 (0.49 - 1.09)	0.125	1.49 (0.94 - 2.18)	0.092
Knowledge related to self-care practices				
Low	1		1	
High	0.44 (0.23 - 0.80)	0.008	0.49 (0.26 - 0.93)	0.031
Perceived of the severity of CKD				
Low	1		1	
High	1.61 (1.08 - 2.41)	<0.018	2.03 (1.32 - 3.14)	0.001
Perceived barriers to performing self-care practices				
Low	1.82 (1.18 - 2.81)	0.006	1.71 (1.09 - 2.69)	0.019
High	1		1	

4. Discussion

This study indicated that the age group of 46 - 60 years, highlighting a meaningful relationship that performed good self-care behaviour. Moreover, the age group 46 - 60 years were found to be 2.41 times more likely to perform good self-care behaviours compared to the younger age group. Similar findings were reported in the previous study conducted in Lao on patients with Type 2 DM aged between

46 - 60 years. This study demonstrated high levels of self-care behaviour among the respondents. Furthermore, research in India found that self-care behaviours were statistically significant among individuals aged 60 years and above. Previous studies of subjects over 60 years old identified factors affecting the risk of CKD in Type 2 DM patients [16]-[18].

A study demonstrates that females are more likely to perform good self-care behaviour than males, with self-care behaviours influenced by their understanding of health and disease, health knowledge, and perceptions of health threats, which together promote their physical and mental well-being through preventive self-care behaviour [19]. A study in Korea found a statistically significant association between the female gender and self-care behaviour [20].

This study indicated were 73.1% of participants were civil servants and retirees/unemployed. The results highlighted a notable relationship between occupational status and self-care behaviour. Additionally, retirees are more likely to be unemployed compared to individuals in other occupations, which aligns with previous research findings. Research conducted in Pakistan revealed that retirees received financial support, including pensions, which enhanced their self-care behaviour [21] [22]. In the family members with a history of CKD, participants who reported no family history of CKD exhibited better self-care practices than those who had a family history of CKD. Individuals with a family history of CKD may demonstrate increased knowledge and improved self-care behaviours [23] [24].

There was a relationship between the knowledge of the risk of CKD, self-care practices and self-care behaviours. This study showed that 31.1% of participants with poor knowledge related to the risk of CKD performed good self-care behaviour. According to a study in Taiwan Region, inadequate knowledge was linked to a high risk of CKD and self-care behaviours [25], A study in Nepal indicated that low knowledge related to the risk of CKD was not significantly associated with self-care behaviour. However, high knowledge related to the risk of CKD was positively associated with self-care behaviours [26]. Furthermore, a previous study in Taiwan Region highlighted the severity of CKD, which might serve as a potential biomarker for CKD progression [27]. According to a previous study in Korea, the severity of CKD might be influenced by self-care behaviour [28].

The results of this study showed that more than one-third of participants with low perceived barriers to self-care practices performed good self-care behaviours. A study in the Netherlands also reported low perceived barriers to accessing self-care behaviour [29]. Moreover, a study in Ghana found low perceived barriers to performing self-care practices with good behaviour [30]. In addition, a previous study in China found that low perceived barriers were a significant predictor of self-care behaviour [31]. The previous study in China on the exploration of the relationship between risk perception and diabetes complications highlights the importance of illness perception toward the risk of CKD-reducing behaviours [32].

The results indicated that nearly half of the participants had a normal BMI.

There was a strong correlation between self-care behaviour and the practices of participants, particularly when comparing those who were overweight or obese. According to the previous study, nearly one-third (30.3%) of participants reported being overweight based on their BMI. The most common self-care factors associated with negative effects were decreased appetite and fatigue [33]. A previous study in Iran reported that the BMI was found to be significantly different between participants who engaged in nutritional self-care behaviour and those who did not. Additionally, there was a notable association between participant age, financial status, and self-care practices [34].

Based on these data, a significant number of patients with Type 2 DM and self-care behaviour participants had a solid understanding of their roles and responsibilities in preventing and controlling CKD. This enhanced knowledge seemed to be connected to their self-care behaviours, likely influenced by the guidelines and training offered by government and public health officials.

Our analysis of survey data has considerable limitations, such as the fact that only one-third of the participants had good self-care behaviour, implying that only a small proportion of participants were analysed. Furthermore, this study was limited to a few variables, leaving many others out. More study with a larger number of samples and variables is required to identify the factors that contribute to self-care behaviour.

5. Conclusion

This study found that the success rate for self-care behaviour is quite high, with the positive predictors including Type 2 DM patients being female, middle-aged, having normal BMI, having knowledge of self-care practices, perceived severity of CKD, and perceived barrier to performing self-care practices. These factors have an impact on the success of self-care behaviour. Multisectoral collaboration in Type 2 DM control is needed to improve index participants' self-care practices, especially to increase prevention and monitor younger participants, and improve the health provider service system. Patients with Type 2 DM should understand the risk of developing CKD. Patients should learn about CKD and recognise early signs like swelling, fatigue, and changes in urine output. Control blood sugar levels to prevent kidney damage. Seek information and consult healthcare providers for resources on CKD prevention.

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Conflicts of Interest

The authors declare no conflicts of interest.

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