Original Research

Open Access

Belitung Nursing Journal
Volume 10(3), 351-359

https://doi.org/10.33546/bnj.3257

Factors influencing self-management behaviors in persons with lupus nephritis: A cross-sectional study

Sirikarn Hanrop[1], Aurawamon Sriyuktasuth[1]*, Kanaungnit Pongthavornkamol[1], Noppawan Piaseu[2], and Ratana Chawanasuntorapoj[3]

[1] Faculty of Nursing, Mahidol University, Bangkok, Thailand
[2] Ramathibodi School of Nursing, Faculty of Medicine, Ramathibodi Hospital, Mahidol University, Bangkok, Thailand
[3] Faculty of Medicine, Siriraj Hospital, Mahidol University, Bangkok, Thailand

Abstract

Background: Patients with lupus nephritis experience disease symptoms and side effects from treatment. Although self-management behaviors are important in patients with this disease, there is limited research on the factors influencing these behaviors.

Objective: This study aimed to examine the factors influencing self-management behaviors in patients with lupus nephritis.

Methods: This cross-sectional study was conducted in 240 patients with lupus nephritis at a university hospital in Thailand between August 2019 and December 2020 using a random sampling method. Data were collected using a demographic and clinical characteristic questionnaire, Self-Management Behavior Questionnaire, Self-efficacy for Managing Chronic Disease: A 6-item Scale, Knowledge about Lupus Nephritis Questionnaire, Family Support Scale, Social Networks in Adult Life Questionnaire, and Memorial Symptom Assessment Scale for Lupus Nephritis. Descriptive statistics and multiple linear regression analyses were employed.

Results: The participants reported a moderate level of self-management behaviors. Multiple regression analyses revealed that disease duration, income, symptoms, self-efficacy, knowledge, family support, social networks, and classes of lupus nephritis significantly explained 21% of the variance in self-management behaviors (R^2 = 0.21; $F_{(8,231)}$ = 7.73; p <0.001). Family support (β = 0.32, p <0.001) and symptoms (β = −0.23, p <0.001) were significant determinants of self-management behaviors in patients with lupus nephritis.

Conclusion: The findings provide valuable insight for nurses to better understand the factors influencing self-management behaviors in patients with lupus nephritis. Patients with low family support and high symptom severity may face difficulty in performing self-management behaviors. Nurses should pay more attention to these patients and provide family-based interventions to optimize self-management behaviors in this population.

Keywords

family support; lupus nephritis; regression analysis; self-efficacy; self-management; social networking; Thailand

***Corresponding author:**
Dr. Aurawamon Sriyuktasuth, D.S.N., Associate Professor
Faculty of Nursing, Mahidol University, Bangkok, Thailand
Email: Aurawamon.sri@mahidol.ac.th

Article info:
Received: 4 February 2024
Revised: 10 March 2024
Accepted: 16 April 2024

E-ISSN: 2477-4073 | P-ISSN: 2528-181X

Background

Lupus nephritis (LN) stands as the prevailing complication of systemic lupus erythematosus (SLE) (Joo et al., 2017), and its incidence tends to increase continuously. The total incidence of LN rose from 0.7 to 1.3 per 100,000 over the years 1976–1989 and 2000-2018. The estimated prevalence of the condition increased from 16.8 per 100,000 in 1985 to 21.2 per 100,000 in 2015 (Hocaoglu et al., 2023). Asian, U.S. and Latin American nations have higher incidences than European nations (Wang et al., 2018). Once patients develop the disease, most of them (70 %) live with it for more than ten years and develop end-stage renal disease (Wang et al., 2018). This disease is usually found in adult women with childbearing age (Hocaoglu et al., 2023).

As LN develops, patients encounter dramatic side effects of treatment, such as moon face, hair loss, and infection (Mejía-Vilet & Ayoub, 2021; Popa et al., 2018; Thong & Chan, 2019). Moreover, symptoms include joint pain, insomnia, headache, and visual impairment, all affecting a patient's functional status (Hanrop et al., 2015). According to studies by Hu and Zhan (2022), patients with LN have mood swings or anxiety throughout their lifespan, including depression, phobias, and bipolar illness. Khiewngam et al. (2014) and Buji et al. (2018) reported that persons with LN have a high rate of mental health issues, which contribute to disease relapse. The progression of the disease is curbed in patients with a high level of drug adherence (Khiewngam et al., 2014; Rivera & Anaya, 2014) because prescribed treatments, including immunosuppressive drugs and steroids, control the disease

and enable the patient to stay in the remission phase (Mejía-Vilet & Ayoub, 2021; Popa et al., 2018; Thong & Chan, 2019).

Patients diagnosed with LN play a crucial role in various aspects of self-care, such as SLE disease activity prevention, kidney damage progression delay, symptom mitigation strategy elaboration, medication, engaging in infection prevention behaviors, understanding the side effects of drugs, and risk factor (including sunlight, infection, and stress) prevention. They perform exercises ineffectively because of limited time and suffering from symptoms, as well as follow-up on the adverse side effects of treatments (Urairat et al., 2012). Moreover, because of the limitations imposed by the disease on the ability of patients to perform daily activities, some patients feel lonely and depressed (Lertwongpaopun et al., 2016). Families and friends play a significant role in figuring out symptom mitigation strategies (Hanrop et al., 2015). To engage in healthy behaviors, patients with LN require adequate knowledge of symptom management and drug adverse effects (Choi et al., 2022). Therefore, patients with LN who have sufficient knowledge to take care of themselves and family support tend to have better health behaviors.

Self-management behaviors (SMB) are essential for patients with chronic diseases, including LN. Effective self-management can improve health outcomes, decelerate disease progression, and delay renal replacement therapy (Welch et al., 2015). Therefore, if healthcare providers understand the determinants of SMB, they can conduct targeted interventions to increase effective SMB in this population. However, numerous existing studies have been conducted to examine factors influencing SMB in various populations, such as patients with diabetes mellitus (Dao-Tran et al., 2018), chronic kidney disease (Washington et al., 2016), hypertension (Douglas & Howard, 2015), chronic obstructive pulmonary disease (Yang et al., 2019), and hemodialysis (Hafezieh et al., 2020).

The Social Learning Model of Self-management was developed to understand factors contributing to SMB (Tobin et al., 1986). According to the model, key factors affecting the SMB include personal, cognitive, socioenvironmental, and physiological factors. This study used this model to guide the factors influencing SMB among patients with LN. Regarding personal factors, income is essential for LN patients in performing health behaviors. According to Yang et al. (2018), patients with SLE who have high income perform more appropriate self-care behaviors than those with low income because patients with high income can access the healthcare system. Higher-income patients with diabetes mellitus display significantly better self-management than low-income patients (Rechenberg et al., 2016). The duration of the disease is another important factor in patients with LN. Patients with LN for a longer duration may have more comorbidities and symptoms due to other diseases and treatment side effects (Lertwongpaopun et al., 2016). However, in patients with diabetes mellitus, poorer SMB has been found in those with longer disease durations (Cho et al., 2018). Each patient with LN experiences a range of symptoms that arise from the disease itself and the side effects of treatment (Hanrop et al., 2015). When patients with LN encounter symptoms, some try to find effective ways to mitigate them. These symptoms could induce SMB in patients with LN.

Among cognitive factors, knowledge of the disease and the ability to apply problem-solving skills and search for strategies are essential in self-management (Qiu et al., 2021). Knowledge is significantly related to relapse prevention behaviors in this population (Urairat et al., 2012). If patients with cardiovascular diseases had sufficient knowledge about their condition, they could apply problem-solving skills and search for self-management strategies (Qiu et al., 2021). Moreover, self-efficacy might affect SMB in patients with LN. In SLE, patients with high self-efficacy can better adhere to treatment (Barr et al., 2023); on the other hand, low self-efficacy is associated with high morbidity, higher levels of depression, higher levels of pain, stiffness, and high fatigue in these patients (Drenkard et al., 2012). In diabetes mellitus (Yao et al., 2019), self-efficacy has been found to improve SMB.

Regarding socioenvironmental factors, families play essential roles in helping patients with LN. Family support is associated with preventive behavior enhancement, reducing relapse rates in patients with LN (Urairat et al., 2012). In diabetes mellitus (Pamungkas et al., 2017; Yang et al., 2017), family support can enhance SMB. Social networks are important for patients regarding self-management behavior development under long-term conditions. In patients with SLE, peer support interventions can improve SMB and peer mentoring with a variety of additional beneficial effects, such as increased well-being, decreased anxiety, and less suicidal ideation (Williams et al., 2018). Social networks improve SMB in patients with chronic heart disease and diabetes mellitus (Heijmans et al., 2017; Reeves et al., 2014).

LN is an autoimmune disease whose pathogenesis might affect the performance of SMB because the severity of inflammation can cause kidney function loss and quickly lead to end-stage renal failure (Rojas-Rivera et al., 2023). This process could increase symptoms and reduce SMB. In hypertension, the severity of the disease affects the performance of SMB (Ding et al., 2018). However, a study by Brenk-Franz et al. (2015) indicated that the severity of the disease in diabetic patients did not affect SMB. Although many studies about SMB and its influencing factors have been conducted in different chronic diseases with different contexts, and findings are mixed, no study was found in patients with LN. To our knowledge, in Thailand, a few studies have been conducted among patients with LN. They explored symptom experience (Hanrop et al., 2015) and factors contributing to relapse prevention behaviors (Urairat et al., 2012) and kidney damage (Lertwongpaopun et al., 2016). Very little is known about factors influencing SMB in the Thai population with LN. Additional study is needed to understand the factors better and develop targeted interventions to enhance SMB in this population. Guided by the Social Learning Model of Self-management, this study aimed to examine personal factors (income, duration of disease, symptoms), cognitive factors (knowledge and self-efficacy), socioenvironmental factors (family support and social network), and physiological factors (classes of LN) influencing SMB in Thai patients with LN. The findings obtained from this study can help nurses develop more scientific and targeted interventions to optimize SMB among this population.

Methods

Study Design

A cross-sectional study was conducted to investigate the factors influencing SMB in patients with LN.

Samples/Participants

The study population included male and female patients with LN who were registered at the medical clinic and the LN clinic in the Outpatient Department (OPD) of a tertiary hospital in Bangkok, Thailand. The sample was selected using a random sampling method per the following criteria: 1) ≥18 years of age, 2) diagnosed with LN by a physician for at least three months, and 3) able to speak, read, and understand Thai. For patients older than 60 years, the General Practitioner Assessment of Cognition was used to evaluate cognitive function (Brodaty et al., 2006). If patients scored nine points, there was no significant cognitive impairment, and they were included in the study. The exclusion criteria consisted of a physician's diagnosis of mental and psychiatric problems, a physician's diagnosis of end-stage renal disease, and treatments for all types of dialysis, kidney transplant, and pregnancy. Based on our literature review, no studies have investigated the factors influencing SMB in patients with LN. According to Tabachnick and Fidell (2007), the sample size calculation was used for 30 cases per parameter. This study consisted of eight parameters, so the total number of participants was 240. There were 80 and 160 patients in the active and inactive phases.

Instruments

Seven instruments were used in this study as follows:

The Demographic and Clinical Characteristic Questionnaire. This instrument was developed by the researchers. The demographic questionnaire was a self-report questionnaire on sex, age, marital status, educational background, occupation, income, and entitlement to medical reimbursement. The clinical characteristic questionnaire was administered by the principal investigator (PI) and consisted of treatments, biopsy results, disease duration, etc.

Self-Management Behavior Questionnaire (SMB Questionnaire). This questionnaire was developed by Lertwongpaopun et al. (2016) and was used to measure SMB in this study. The questionnaire assessed SMB in patients with LN in the following six dimensions: health communication (Items 1–10), nutrition (Items 11–18), stress reduction (Items 19–28), physical activity (Items 29–31), medication management (Items 32–36), and avoidance of risk factors (Items 37–42). The scale consists of 42 items rated on a 4-point Likert scale. The total scores for self-management ranged from 42 to 168 points, in which a score of less than 115 was considered low self-management; a score of 116–137 was regarded as moderate self-management; and a score of >137 indicated that participants had high self-management. Cronbach's alpha coefficient was 0.87.

Self-Efficacy for Managing Chronic Disease: A 6-item Scale. The Self-efficacy for Managing Chronic Disease 6-item Scale was developed by Lorig et al. (2001). The scale was translated into Thai by bilingual experts in English and Thai using the back-translation method (Brislin, 1970). The meaning equivalence of the original language and backward-translated versions was evaluated. The translation procedure was repeated until the highest level of similarity between the two versions was achieved. This scale covers common domains across many chronic diseases, such as symptom control, role function, emotional functioning, and physician communication. Scores range from 6 to 60, with high scores indicating that patients have a high level of self-efficacy. A score of 6–23 was considered a low level of self-efficacy, a score of 24–41 indicated a moderate level of self-efficacy, and a score of 42–60 showed a high level of self-efficacy. Cronbach's alpha coefficient for the Self-efficacy for Managing Chronic Disease 6-item Scale Thai version was 0.92.

Knowledge About LN Questionnaire. The questionnaire on knowledge about systemic lupus erythematosus (Thaipanich et al., 2008) was modified by the researchers after receiving permission from the developers. To use this scale in patients with LN, the word "SLE" was replaced with "LN," and to measure knowledge more specific to patients with LN, the item "should eat all kinds of food" was replaced with "should avoid salty foods." After modification, the questionnaire validity was assessed by a panel of three experts, including one nephrologist and two nurses with extensive experience in providing care to patients with LN. The instrument, whose scores range from 0 to 20, contains 20 items and covers disease, medication adherence, and self-care. A score of 0 - 12 was considered a low level of knowledge, a score of > 12 - 17 was regarded as moderate knowledge, and a score > 17 - 20 was considered good knowledge. The test-retest reliability of the questionnaire on knowledge about LN was 1.

Family Support Scale (FSS). The FSS was developed by Xu (2005) and has been used in diabetic patients. After receiving permission from the developers, the researchers modified this instrument for appropriate use in patients with LN. The word "diabetes" was replaced with "LN," and the word "urine glucose" was replaced with "proteinuria." The Thai version of the FSS was translated using the back-translation method (Brislin, 1970). The validity of the scale was assessed by a panel of three experts, including one nephrologist and two nurses with extensive experience in providing care to patients with LN. The scale contains six items rated on a 5-point Likert scale. The instrument had scores ranging from 6 to 30 points, with higher scores indicating a high level of family support. A score of 6–13 indicated low family support, 14–21 indicated moderate family support, and 22–30 indicated high family support. Cronbach's alpha coefficient of the FSS Thai version was 0.84.

Social Networks in Adult Life Questionnaire (SNAL). The SNAL was developed by Antonucci and Akiyama (1987). The questionnaire has been used to evaluate the structures, characteristics of network ties, and functions of social networks. This study used structures (size of social networks) to measure social networks. The participants identified the number of people involved in their lives in a set of three concentric circles representing the degree of involvement between the participants and the people in their social network. The total number of people in the circles indicates the size of the social network. The Thai version of the SNAL was translated using the back-translation method (Brislin, 1970).

Memorial Symptom Assessment Scale (MSAS) for LN. The original version of the MSAS was developed by Portenoy et al. (1994). The instrument was first used to assess 32 symptoms in patients with cancer. This instrument, modified

for use in patients with LN by Hanrop et al. (2015), contains 28 symptoms. The researchers obtained permission from the developers of both original and modified versions to use the scale in this study. The dimensions of symptoms include symptom occurrence, frequency of symptoms, severity, and distress. The evaluation of frequency and severity uses a 4-point Likert scale ranging from 1 (rarely) to 4 (always). The distress of symptoms is assessed using a 5-point Likert scale ranging from 0 (no distress) to 4 (the most distress symptoms). The scoring of the distress domain consists of no distress (0.8) to the most distressing symptom (4) (Portenoy et al., 1994). The MSAS was translated into Thai by Suwisith et al. (2008). High scores for all dimensions indicated that patients had high symptom occurrence, severity, frequency, and distress. Cronbach's alpha coefficient of the modified MSAS for the LN Thai version was 0.97.

Data Collection

After receiving ethical approval from the Institutional Review Board, the researchers obtained permission from the tertiary hospital to collect and review data in medical records. The researchers used a computer program to randomly select the participants until they completed the number of participants in the active and inactive phases. The PI explained to the participants how to complete the questionnaires. Data were collected by the PI while the participants were waiting to meet their physicians or receive medications. The data collection process took approximately 45–60 min, and the participants were free to take breaks while completing the questionnaires.

Data Analysis

All data analyses were performed using SPSS (the Statistical Package for Social Science for Windows, licensed by Mahidol University). Analyses of frequency, percentage, mean, range, and standard deviation were performed on the subjects' demographic and clinical data. The associations between income, disease duration, symptoms, knowledge, self-efficacy, family support, social networks, classes of LN, and SMB of patients with LN were examined using Pearson's product-moment correlation coefficient. Guided by the Social Learning Model of Self-management, the multiple linear regression with the ENTER method was performed. According to the model, all factors (personal, cognitive, social, environmental, and physiological) directly contribute to SMB. The statistical assumptions were checked prior to conducting the main analysis.

Ethical Considerations

Before collecting data, the study was approved by the Institutional Review Board, Faculty of Medicine, Siriraj Hospital (200/2562(EC3)), and permission was granted for data collection. The PI met the participants to introduce herself and build rapport, and she explained the research objectives, expected benefits, and procedures the participants would be required to perform. Participants were free to consent or refuse to participate. The participants were able to withdraw during the study without advancing any reasons for their decision or incurring any effects on treatment. The PI informed the participants that all data would be anonymized and kept confidential.

Results

Demographic Characteristics of Participants

The majority of the participants were female (92.5 %). The ages of the participants ranged from 18 years to 75 years, with a mean value of 36.2 ± 12.3 years. More than half of the participants were single (55%), and more than one-third lived with their parents (34.2 %). Almost half (48.8%) reported sufficient income under the universal coverage scheme (47.9%) (**Table 1**).

Table 1 The demographic characteristics of participants (*N* = 240)

Characteristics	*n*	%
Sex		
Female	222	92.5
Male	18	7.5
Age (year)		
(Mean = 36.2, Min = 18, Max = 75, Standard Deviation = 12.3)		
18–29	88	36.7
30–39	67	27.9
40–49	48	20.0
50–59	26	10.8
≥60	11	4.6
Income (Baht/month)		
(Mean = 16,865.7, Median = 11,000 Min = 0, Max = 440,000, Standard Deviation = 33,793.7)		
<15,000	160	66.7
15,000–25,000	33	13.8
25,001–35,000	27	11.3
>35,000	20	8.2
<15,000	160	66.7

Clinical Characteristics

Nearly half (45.4%) of the study participants had been diagnosed with SLE for more than ten years, with a mean duration of 11.8 ± 8.7 years, and had developed LN within a mean duration of 10.1 ± 8.61 years. More than half of our participants (55.4%) were diagnosed with Class IV LN. Most participants took prednisolone (79.2%).

Descriptive Results of the Study Variables

The participants had a good knowledge (Mean: 17.2 ± 2.3) and a high self-efficacy score (Mean: 46.8 ± 9.3). The mean score for family support was also high (Mean: 22.4 ± 5.8). The mean number of social networks was 8.20 ± 13.3. The total scores of SMB ranged from 42 points to 168 points, with a mean value of 124.6 ± 15.7, which indicated a moderate level (**Table 2**).

Table 2 Descriptive results of the knowledge about LN, self-efficacy, family support, size of the social network, symptoms, and SMB

Variables	*n*	%			
Knowledge about LN					
(Mean = 17.2, Standard Deviation = 2.3, Min = 9, Max = 20)					
Good	168	70.0			
Moderate	65	27.1			
Low	7	2.9			
Self-efficacy					
(Mean = 46.8, Standard Deviation = 9.3, Min = 25, Max = 60)					
Low	0	0			
Moderate	68	28.3			
High	172	71.7			
Family support					
(Mean = 22.4, Standard Deviation = 5.8, Max = 30, Min = 6)					
Low	19	7.9			
Moderate	74	30.8			
High	147	61.3			
Size of the social network					
(Mean = 8.2, Standard Deviation = 13.3, Max = 151, Min = 0)					
<10	186	77.5			
10–20	34	14.2			
<20	20	8.3			
Symptoms					
(Mean = 8.4, Standard Deviation = 8.1)			**Frequency**	**Severity**	**Distress**
Sleeping difficulty	113	47.1	2.12	1.60	1.53
Feeling irritable	110	45.8	1.89	1.49	1.45
Fatigue	108	45.0	1.72	1.44	1.36
Hair loss	107	44.6	2.23	1.68	1.57
Visual loss	96	40.0	2.07	1.55	1.45
Dizziness	96	40.0	1.66	1.39	1.40
Headache	96	40.0	1.82	1.53	1.52
SMB					
(Mean = 124.6, Standard Deviation = 15.7, Max = 162, Min = 79)					
Low	70	29.2			
Moderate	111	46.3			
High	59	24.6			

Factors Influencing SMB in Patients with LN

Before conducting multiple regression analyses, the relationships between the variables were calculated by using Pearson's product-moment correlation. The relationships ranged from 0.11 to 0.35, and the results showed that self-efficacy (r = 0.23, p <0.001), family support (r = 0.35, p <0.001), symptoms (r = −0.28, p <0.001), and knowledge (r = 0.13, p <0.05) had significant correlations with SMB. After entering all variables in the model using the ENTER method, the results showed that all eight predictors significantly accounted for 21% of the variance (R^2 = 0.21, $F_{(8,231)}$ = 7.73, p <0.001) in SMB in patients with LN. However, only family support (β = 0.32, p <0.001) and symptoms (β = −0.23, p <0.001) significantly affected SMB (**Table 3**).

Table 3 Multiple linear regression analysis of factors predicting SMB

Model	B	SE	Beta (β)	*t*	*p*-value
Self-efficacy	0.08	0.11	0.05	0.75	0.457
Family support	0.88	0.17	0.32	5.22	<0.001
Knowledge	0.85	0.44	0.12	1.95	0.052
Social network	0.03	0.07	0.03	0.41	0.679
Symptoms	−0.09	0.03	−0.23	−3.56	<0.001
Income	−1.06	.000	−0.02	−0.32	0.710
Duration of LN	0.20	0.11	0.10	1.74	0.083
Classification of LN	1.33	1.04	0.76	1.28	0.201
$R = 0.46$, $R^2 = 0.21$, $F_{(8,231)} = 7.73$, Constant = 82.79, p <0.001					

Discussion

Most of the participants were female. This finding is congruent with previous studies conducted in Thailand and abroad (Lertwongpaopun et al., 2016; Wang et al., 2018). Because of the estrogen hormone, LN is usually found in adult women, especially in African and Asian patients (Almaani et al., 2017). Therefore, sex and age may be risk factors for developing autoimmune diseases, including LN. The most common class identified by renal biopsies is Class IV. Class IV LN is most commonly found among Thai people (Prasanwong et al., 2020; Urairat et al., 2012).

The participants had a moderate mean self-management level. This finding differs from findings in patients with diabetes mellitus (Boontein et al., 2021) and chronic pulmonary disease (Yang et al., 2019) because of different specific health

behaviors that are important in various diseases and measurements. In this study, the inactive group had severe symptoms and needed to take high doses of steroids or immunosuppressive drugs that affected their performance in SMB. It is possible that the participants could perform SMB to a moderate degree because of their higher levels of education. People with high education can assess or seek information on performing SMB independently as they can consult with healthcare providers or search for information from various sources.

In this study, symptoms in the personal domain and family support in the social-environmental domain could significantly affect self-management behavior. The mean score for family support was high. These findings are similar to those in other chronic diseases such as diabetes mellitus (Pamungkas et al., 2017), cancer (Peñarrieta et al., 2015), and hypertension (Peñarrieta et al., 2015). In Asian countries, including Thailand, family members are essential in supporting, encouraging, and helping patients to practice SMB. Regarding financial support, some participants were unemployed and students, indicating ongoing reliance on family support. Family support was found to be the strongest factor influencing SMB. The findings of this study are in line with those of other studies that found that family support was an essential factor associated with self-management among patients with diabetes mellitus (Dao-Tran et al., 2018; Gunggu et al., 2016). In Thailand, family support is the most important determinant of relapse prevention behaviors in patients with LN (Urairat et al., 2012). Families can provide physical, financial, and emotional support. In particular, during the active phase of SLE, families play a vital role in supporting participants in continuing to perform healthy behaviors and daily activities.

Symptoms were significantly associated with SMB. This finding ties in with previous studies conducted in patients with LN (Hanrop et al., 2015). The participants reported many physical and mental symptoms resulting from their disease, treatment side effects, and everyday life. Sleep difficulty is among the most prevalent symptoms reported with high frequency and severity. Other symptoms, such as muscle and joint pain, may have been the main reasons why participants felt it was difficult to fall asleep or easy to wake up from sleep. Some medications (such as corticosteroids) that treat the disease cause sleep disturbances. Psychological problems such as stress, anxiety, and distress can affect people with this condition and make it difficult for them to sleep (Palagini et al., 2014).

Symptoms were another significant variable influencing SMB among patients with LN. In many diseases, a higher symptom burden is significantly associated with worse scores in all self-management domains for pulmonary disease (Bringsvor et al., 2018). Symptoms might involve limited physical function for engagement in SMB (Hanrop et al., 2015), whereby participants with more symptoms may need to rely on others for daily activities. They may find it challenging to engage in self-management independently. It is possible that participants with symptoms such as muscle and joint pain could not engage in SMB such as physical activity.

Income levels did not significantly affect SMB. This finding does not tie in with those of a previous study conducted in diabetic patients (Rechenberg et al., 2016). Some high-income patients may engage in unhealthy behaviors such as lack of exercise, or they may have more severe symptoms that limit their ability to engage in self-management effectively. The disease duration was not significantly associated with SMB. This result is inconsistent with findings that the duration of diabetes mellitus was associated with SMB among Chinese patients (Yao et al., 2019). The participants received care and treatment from a tertiary-level hospital in the capital city of Thailand, regularly followed up with their healthcare providers, and engaged in SMB to optimize their long-term prognosis (Williams et al., 2018). Depending on the severity of the disease and their capacity to engage in self-management activities, patients with shorter or longer durations of LN can enhance their SMB.

Knowledge and self-efficacy also could not significantly predict SMB in LN. This finding differs from some studies on COPD (Yang et al., 2019) and hemodialysis (Hafezieh et al., 2020). Because some of the patients in this study continued to experience symptoms and remained in the active phase, even those who had a high level of disease knowledge may not have managed their symptoms adequately. Regarding self-efficacy, this result differs from findings in patients with diabetes mellitus (Yao et al., 2019). The participants in the present study may not have been able to perform and maintain self-management correctly during severe or uncontrolled symptoms or the active period.

Social networks had no significant association with SMB. This result is inconsistent with previous studies conducted on diabetic patients (Spencer-Bonilla et al., 2017). The amount of social network support for self-management practices may not accurately reflect the quality of that support. Research findings indicate that the LN class is not significantly associated with SMB in LN. Self-management practices were mostly connected with symptoms rather than with LN classifications.

Implications for Nursing Practice

The findings suggest that professional nurses should assess SMB and implement efficient interventions for symptom management, family support improvements, and SMB enhancement in patients with LN. These interventions can potentially modify factors contributing to SMB in LN patients. Strategies to promote sleep quality and psychological well-being and relieve muscle and joint pain should be implemented to reduce physical and mental symptoms. Nurses should collaborate with other healthcare providers to develop holistic care to enhance SMB. Additionally, nurses should pay special attention to patients with low family support and provide family-based interventions to optimize SMB in this population. Overall, tailored education, collaborative care, and promoting peer support are vital. Nurses should monitor patients regularly, address cultural factors sensitively, and provide individualized interventions. By involving families, addressing symptoms, and fostering peer support, nurses can empower LN patients to adhere to self-management strategies effectively. Collaborative care and cultural sensitivity enhance patient outcomes, emphasizing the pivotal role of nurses in facilitating holistic care and improving the quality of life for those living with LN.

Limitations

Some limitations should be addressed. The study focused solely on Thai patients with LN, which restricts the

generalizability of the findings to other populations with different sociocultural contexts or healthcare systems. Factors influencing SMB may vary among different ethnicities, socioeconomic backgrounds, or healthcare settings. The study also recruited participants from a single tertiary hospital in Bangkok, which may not represent the diversity of patients with LN across Thailand. Patients from rural areas or those who receive care from other healthcare facilities might have different experiences and factors influencing their SMB. In addition, the majority of the individuals had solid educational foundations, adequate understanding of LN, supportive families, and high levels of self-efficacy. Therefore, caution should be exercised when extrapolating the findings of this study to LN individuals with distinct characteristics.

Conclusion

In this study, participants with LN had moderate SMB. Only the environmental factor (family support) and the personal factor (symptoms) could significantly predict SMB. Based on these findings, nurses should focus on symptom mitigation and family support enhancement to enhance SMB. It is essential to encourage family-based interventions that improve SMB. The intervention should be used routinely, emphasizing patients with high scores and little family support.

Declaration of Conflicting Interest

None.

Funding

None.

Acknowledgment

We would like to thank the respondents who participated in this study.

Authors' Contributions

Sirikarn Hanrop initiated the study, collected data, performed the statistical analysis, and prepared the manuscript. All authors contributed to the study's conception and design. Aurawamon Sriyuktasuth, Kanaungnit Pongthavornkamol, Noppawan Piaseu, and Ratana Chawanasuntorapoj gave suggestions to revise the data analysis. Aurawamon Sriyuktasuth contributed to the revised manuscript. All authors were accountable for the study processes and approved the final version of the manuscript.

Authors' Biographies

Sirikarn Hanrop, MSN is a PhD candidate (Nursing) at the Faculty of Nursing and Ramathibodi School of Nursing, Faculty of Medicine Ramathibodi Hospital. She is also a teaching assistant at the Faculty of Nursing, Mahidol University, Bangkok, Thailand.

Associate Professor Dr. Aurawamon Sriyuktasuth, D.S.N is an associate professor at the Faculty of Nursing, Mahidol University, Bangkok, Thailand.

Associate Professor Kanaungnit Pongthavornkamol, PhD is an associate professor at the Faculty of Nursing, Mahidol University, Bangkok, Thailand.

Prof. Noppawan Piaseu, PhD is a Professor at the Ramathibodi School of Nursing, Faculty of Medicine Ramathibodi Hospital, Mahidol University, Bangkok, Thailand.

Dr. Ratana Chawanasuntorapoj, MD is an Assistant Professor at the Faculty of Medicine, Siriraj Hospital, Mahidol University, Bangkok, Thailand.

Data Availability

The datasets analyzed during the current study are available from the corresponding author upon reasonable request.

Declaration of Use of AI in Scientific Writing

Nothing to disclose.

References

Almaani, S., Meara, A., & Rovin, B. H. (2017). Update on lupus nephritis. *Clinical Journal of the American Society of Nephrology*, *12*(5), 825-835. https://doi.org/10.2215/CJN.05780616

Antonucci, T. C., & Akiyama, H. (1987). Social networks in adult life and a preliminary examination of the convoy model. *Journal of Gerontology*, *42*(5), 519-527. https://doi.org/10.1093/geronj/42.5.519

Barr, A. C., Clowse, M., Maheswaranathan, M., Eder, L., Eudy, A. M., Criscione-Schreiber, L. G., Rogers, J. L., Sadun, R. E., Doss, J., & Sun, K. (2023). Association of hurried communication and low patient self-efficacy with persistent nonadherence to lupus medications. *Arthritis Care & Research*, *75*(1), 69-75. https://doi.org/10.1002/acr.25030

Boontein, P., Poungkaew, A., Praphasil, O., & Kuakool, P. (2021). Factors predicting self-management behaviors in patients with type II diabetes. *Nursing Science Journal of Thailand*, *39*(1), 13-23.

Brenk-Franz, K., Strauss, B., Tiesler, F., Fleischhauer, C., Ciechanowski, P., Schneider, N., & Gensichen, J. (2015). The influence of adult attachment on patient self-management in primary care-the need for a personalized approach and patient-centred care. *PloS One*, *10*(9), e0136723. https://doi.org/10.1371/journal.pone.0136723

Bringsvor, H. B., Skaug, K., Langeland, E., Oftedal, B. F., Assmus, J., Gundersen, D., Osborne, R. H., & Bentsen, S. B. (2018). Symptom burden and self-management in persons with chronic obstructive pulmonary disease. *International Journal of Chronic Obstructive Pulmonary Disease*, *13*, 365-373. https://doi.org/10.2147/COPD.S151428

Brislin, R. W. (1970). Back-translation for cross-cultural research. *Journal of Cross-Cultural Psychology*, *1*(3), 185-216. https://doi.org/10.1177/135910457000100301

Brodaty, H., Low, L. F., Gibson, L., & Burns, K. (2006). What is the best dementia screening instrument for general practitioners to use? *The American Journal of Geriatric Psychiatry*, *14*(5), 391-400. https://doi.org/10.1097/01.JGP.0000216181.20416.b2

Buji, R. I., Abdul Murad, N. A., Chan, L. F., Maniam, T., Mohd Shahrir, M. S., Rozita, M., Shamsul, A. S., Mohamad Hussain, R., Abdullah, N., & Jamal, R. (2018). Suicidal ideation in systemic lupus erythematosus: NR2A gene polymorphism, clinical and psychosocial factors. *Lupus*, *27*(5), 744-752. https://doi.org/10.1177/0961203317742711

Cho, S., Kim, M., & Park, K. (2018). Self-management levels of diet and metabolic risk factors according to disease duration in patients with type 2 diabetes. *Nutrition Research and Practice*, *12*(1), 69-77. https://doi.org/10.4162%2Fnrp.2018.12.1.69

Choi, M. Y., Hahn, J., Malspeis, S., Stevens, E. F., Karlson, E. W., Sparks, J. A., Yoshida, K., Kubzansky, L., & Costenbader, K. H. (2022). Association of a combination of healthy lifestyle behaviors with reduced risk of incident systemic lupus erythematosus. *Arthritis & Rheumatology*, *74*(2), 274-283. https://doi.org/10.1002/art.41935

Dao-Tran, T. H., Anderson, D., Chang, A., Seib, C., & Hurst, C. (2018). Factors associated with self-management among Vietnamese adults with type 2 diabetes. *Nursing Open*, *5*, 507-516. https://doi.org/10.1002/nop2.158

Ding, W., Li, T., Su, Q., Yuan, M., & Lin, A. (2018). Integrating factors associated with hypertensive patients' self-management using structural equation modeling: A cross-sectional study in Guangdong, China. *Patient Preference and Adherence*, *12*, 2169-2178. https://doi.org/10.2147/PPA.S180314

Douglas, B. M., & Howard, E. P. (2015). Predictors of self-management behaviors in older adults with hypertension. *Advances in Preventive Medicine*, *2015*, 960263. https://doi.org/10.1155/2015/960263

Drenkard, C., Dunlop-Thomas, C., Easley, K., Bao, G., Brady, T., & Lim, S. S. (2012). Benefits of a self-management program in low-income African-American women with systemic lupus erythematosus: Results of a pilot test. *Lupus*, *21*(14), 1586-1593. https://doi.org/10.1177/0961203312458842

Gunggu, A., Thon, C. C., & Whye Lian, C. (2016). Predictors of diabetes self-management among type 2 diabetes patients. *Journal of Diabetes Research*, *2016*, 9158943. https://doi.org/10.1155/2016/9158943

Hafezieh, A., Dehghan, M., Taebi, M., & Iranmanesh, S. (2020). Self-management, self-efficacy and knowledge among patients under haemodialysis: A case in Iran. *Journal of Research in Nursing*, *25*(2), 128-138. https://doi.org/10.1177/1744987120904770

Hanrop, S., Puwarawuttipanit, W., Sriyuktasuth, A., & Sritippayawan, S. (2015). Symptom experiences, management strategies, and functional status in lupus nephritis patients. *Nursing Science Journal of Thailand*, *33*(4), 65-75.

Heijmans, N., Van Lieshout, J., & Wensing, M. (2017). Information exchange networks of health care providers and evidence-based cardiovascular risk management: An observational study. *Implementation Science*, *12*, 7. https://doi.org/10.1186/s13012-016-0532-1

Hocaoglu, M., Valenzuela-Almada, M. O., Dabit, J. Y., Osei-Onomah, S. A., Chevet, B., Giblon, R. E., Zand, L., Fervenza, F. C., Helmick, C. G., & Crowson, C. S. (2023). Incidence, prevalence, and mortality of lupus nephritis: A population-based study over four decades using the lupus midwest network. *Arthritis & Rheumatology*, *75*(4), 567-573. https://doi.org/10.1002/art.42375

Hu, Y., & Zhan, G. (2022). Anxiety and depression prevalence and their risk factors in lupus nephritis patients: A case–control study. *Immunity, Inflammation and Disease*, *10*, e689. https://doi.org/10.1002/iid3.689

Joo, Y. B., Won, S., Choi, C. B., & Bae, S. C. (2017). Lupus nephritis is associated with more corticosteroid-associated organ damage but less corticosteroid non-associated organ damage. *Lupus*, *26*(6), 598-605. https://doi.org/10.1177/0961203316671813

Khiewngam, K., Hengpraprom, S., Lohsoonthorn, V., & Avihingsanon, Y. (2014). Factors associated with disease relapses in lupus nephritis patients. *Vajira Medical Journal: Journal of Urban Medicine*, *58*(2), 39-49.

Lertwongpaopun, W., Tilokskulchai, F., Sindhu, S., Pattaragan, A., & Chai-Aroon, T. (2016). Factors associated with kidney damage among Thais with lupus nephritis. *Pacific Rim International Journal of Nursing Research*, *20*(4), 309-319.

Lorig, K. R., Sobel, D. S., Ritter, P. L., Laurent, D., & Hobbs, M. (2001). Effect of a self-management program on patients with chronic disease. *Effective Clinical Practice: ECP*, *4*(6), 256-262.

Mejía-Vilet, J. M., & Ayoub, I. (2021). The use of glucocorticoids in lupus nephritis: New pathways for an old drug. *Frontiers in Medicine*, *8*, 622225. https://doi.org/10.3389/fmed.2021.622225

Palagini, L., Tani, C., Mauri, M., Carli, L., Vagnani, S., Bombardieri, S., Gemignani, A., & Mosca, M. (2014). Sleep disorders and systemic lupus erythematosus. *Lupus*, *23*(2), 115-123. https://doi.org/10.1177/0961203313518623

Pamungkas, R. A., Chamroonsawasdi, K., & Vatanasomboon, P. (2017). A systematic review: Family support integrated with diabetes self-management among uncontrolled type II diabetes mellitus patients. *Behavioral Sciences*, *7*(3), 62. https://doi.org/10.3390/bs7030062

Peñarrieta, M. I., Flores-Barrios, F., Gutiérrez-Gómez, T., Piñones-Martínez, S., Resendiz-Gonzalez, E., & Quintero-Valle, L. M. (2015). Self-management and family support in chronic diseases. *Journal of Nursing Education and Practice*, *5*(11), 73-80. https://doi.org/10.5430/jnep.v5n11p73

Popa, R., Lautaru, L.-A., Lucretiu, R., Ruiu, D. C., Caragea, D., Olteanu, M., Mihailovici, A. R., Ene, C., Padureanu, V., Padureanu, R., & Cirlig, V. (2018). Therapy side effects in systemic lupus erythematosus. *Current Health Sciences Journal*, *44*(3), 316-321. https://doi.org/10.12865%2FCHSJ.44.03.18

Portenoy, R. K., Thaler, H. T., Kornblith, A. B., Lepore, J. M., Friedlander-Klar, H., Kiyasu, E., Sobel, K., Coyle, N., Kemeny, N., & Norton, L. (1994). The Memorial Symptom Assessment Scale: An instrument for the evaluation of symptom prevalence, characteristics and distress. *European Journal of Cancer*, *30*(9), 1326-1336. https://doi.org/10.1016/0959-8049(94)90182-1

Prasanwong, T., Laoharojvongsa, N., Pongpanich, K., Satirapoj, B., & Charoenpitakchai, M. (2020). Pathological assessment of activity and chronicity indices in lupus nephritis patients. *Asian Archives of Pathology*, *2*(3), 5-19.

Qiu, R., Schick-Makaroff, K., Tang, L., Wang, X., Zhang, Q., & Ye, Z. (2021). 'There is always a way to living with illness'—Self-management strategies reported by Chinese hospitalized patients with cardiovascular disease: A descriptive qualitative study. *The International Journal of Health Planning and Management*, *36*(4), 1260-1275. https://doi.org/10.1002/hpm.3172

Rechenberg, K., Whittemore, R., Grey, M., Jaser, S., & Teen, C. R. G. (2016). Contribution of income to self-management and health outcomes in pediatric type 1 diabetes. *Pediatric Diabetes*, *17*(2), 120-126. https://doi.org/10.1111/pedi.12240

Reeves, D., Blickem, C., Vassilev, I., Brooks, H., Kennedy, A., Richardson, G., & Rogers, A. (2014). The contribution of social networks to the health and self-management of patients with long-term conditions: A longitudinal study. *PloS One*, *9*(6), e98340. https://doi.org/10.1371/journal.pone.0098340

Rivera, F., & Anaya, S. (2014). Lupus nephritis flare in young patients: Relapse or nonadherence to treatment? *International Journal of Nephrology and Renovascular Disease*, *7*, 117-121. https://doi.org/10.2147/IJNRD.S58206

Rojas-Rivera, J. E., García-Carro, C., Ávila, A. I., Espino, M., Espinosa, M., Fernández-Juárez, G., Fulladosa, X., Goicoechea, M., Macía, M., & Morales, E. (2023). Diagnosis and treatment of lupus nephritis: A summary of the Consensus Document of the Spanish Group for the Study of Glomerular Diseases (GLOSEN). *Clinical Kidney Journal*, *16*(9), 1384-1402. https://doi.org/10.1093/ckj/sfad055

Spencer-Bonilla, G., Ponce, O. J., Rodriguez-Gutierrez, R., Alvarez-Villalobos, N., Erwin, P. J., Larrea-Mantilla, L., Rogers, A., & Montori, V. M. (2017). A systematic review and meta-analysis of trials of social network interventions in type 2 diabetes. *BMJ Open*, *7*(8), e016506. https://doi.org/10.1136/bmjopen-2017-016506

Suwisith, N., Hanucharurnkul, S., Dodd, M., Voraponsathorn, T., Pongthavorakamol, K., & Asavametha, N. (2008). Symptom clusters and their influences on the functional status of women with breast cancer. *Thai Journal of Nursing Research*, *12*(3), 153-165.

Tabachnick, B. G., & Fidell, L. S. (2007). *Using multivariate statistics* (7th ed.). New York: Allyn & Bacon/Pearson Education.

Thaipanich, A., Wongchinsri, J., Auamnoy, T., & Hemachudha, A. (2008). Factors associating with systemic lupus erythematosus disease activity. *Thai Pharmaceutical and Health Science Journal*, *3*(2), 237-244.

Thong, K. M., & Chan, T. M. (2019). Infectious complications in lupus nephritis treatment: A systematic review and meta-analysis. *Lupus*, *28*(3), 334-346. https://doi.org/10.1177/0961203319829817

Tobin, D. L., Reynolds, R. V. C., Holroyd, K. A., & Creer, T. L. (1986). Self-management and social learning theory. In *Self-management of chronic disease: Handbook of clinical interventions and research* (pp. 29-55). Academic Press.

Urairat, P., Puwarawuttipanit, W., Sriyuktasuth, A., & Teerapornlertratt, T. (2012). Factors influencing relapse prevention behaviors in lupus nephritis patients. *Nursing Science Journal of Thailand*, *30*(3), 55-63.

Wang, H., Ren, Y. L., Chang, J., Gu, L., & Sun, L. Y. (2018). A systematic review and meta-analysis of prevalence of biopsy-proven lupus nephritis. *Archives of Rheumatology*, *33*(1), 17-25. https://doi.org/10.5606%2FArchRheumatol.2017.6127

Washington, T., Zimmerman, S., & Browne, T. (2016). Factors associated with chronic kidney disease self-management. *Social Work in Public Health*, *31*(2), 58-69. https://doi.org/10.1080/19371918.2015.1087908

Welch, J. L., Johnson, M., Zimmerman, L., Russell, C. L., Perkins, S. M., & Decker, B. S. (2015). Self-management interventions in stages 1 to 4 chronic kidney disease: An integrative review. *Western Journal of Nursing Research*, *37*(5), 652-678. https://doi.org/10.1177/0193945914551007

Williams, E. M., Hyer, J. M., Viswanathan, R., Faith, T. D., Voronca, D., Gebregzaibher, M., Oates, J. C., & Egede, L. (2018). Peer-to-peer mentoring for African American women with lupus: A feasibility pilot. *Arthritis Care & Research*, *70*(6), 908-917. https://doi.org/10.1002/acr.23412

Xu, Y. (2005). *Understanding the factors influencing diabetes self-management in Chinese people with type 2 diabetes using structural equation modeling* [Unpublished Dissertation, University of Cincinnati].

Yang, H., Wang, H., Du, L., Wang, Y., Wang, X., & Zhang, R. (2019). Disease knowledge and self-management behavior of COPD patients in China. *Medicine*, *98*(8), e14460. https://doi.org/10.1097/MD.0000000000014460

Yang, H., Xie, X., Song, Y., Nie, A., & Chen, H. (2018). Self-care agency in systemic lupus erythematosus and its associated factors: A cross-

sectional study. *Patient Prefer Adherence*, *12*, 607-613. https://doi.org/10.2147/ppa.s162648

Yang, L., Wu, Q., Hao, Y., Cui, Y., Liang, L., Gao, L., Jiao, M., Ning, N., Sun, H., & Kang, Z. (2017). Self-management behavior among patients with diabetic retinopathy in the community: A structural equation model. *Quality of Life Research*, *26*, 359-366. https://doi.org/10.1007/s11136-016-1396-1

Yao, J., Wang, H., Yin, X., Yin, J., Guo, X., & Sun, Q. (2019). The association between self-efficacy and self-management behaviors among Chinese patients with type 2 diabetes. *PloS One*, *14*(11), e0224869. https://doi.org/10.1371/journal.pone.0224869

Cite this article as: Hanrop, S., Sriyuktasuth, A., Pongthavornkamol, K., Piaseu, N., & Chawanasuntorapoj. R. (2024). Factors influencing self-management behaviors in persons with lupus nephritis: A cross-sectional study. *Belitung Nursing Journal, 10*(3), 351-359. https://doi.org/10.33546/bnj.3257