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Assessment of Adherence, Quality of Life, and Self-efficacy Among Iraqi Patients with Systemic Lupus Erythematosus: A Single-center Study

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Abstract

Systemic Lupus Erythematosus (SLE) is an immune-mediated disease with severe morbidity and tissue damage. Adherence to therapy in SLE patients remains a significant problem, and nonadherence can lead to poor disease outcomes and decreased quality of life. Self-efficacy is also a critical aspect of disease control and medication adherence. This study aims to evaluate medication adherence, quality of life, and self-efficacy among patients with SLE and their correlation with sociodemographic and clinical factors. This was a cross-sectional study conducted at Baghdad Teaching Hospital's Rheumatology Unit from November 2024 to January 2025, evaluating adherence, quality of life, and self-efficacy among SLE patients using the Compliance Questionnaire for Rheumatology (CQR), the World Health Organisation Quality of Life Questionnaire (WHOQOL-BREF), and Self-Efficacy for Managing Chronic Disease 6-Item Scale (SEMCD) respectively. In addition, the Safety of Oestrogens in Lupus Erythematosus National Assessment and the Systemic Lupus Erythematosus Disease Activity Index score (SELENA-SLEDAI) was used to measure the disease activity. The study recruited 118 individuals aged 35.03±10.52 years old on average, and 94.1% did not receive the flu vaccine in the past year. The average CQR score was 64.32, and 12.7% of the patients adhered to the therapy; the WHOQOL-BREF psychological score was at its minimum value of 9.90, while the social score attained the maximum value of 12.21, and the average SEMCD score for the patients was 39.88. The adherence score significantly correlated with residency and SELENA-SLEDAI. In addition, WHOQOL-BREF scores demonstrated a significant correlation with residency, exercise, SELENA-SLEDAI, disease duration, and the number of chronic diseases. The SEMCD score was also associated with residency, and SELENA-SLEDAI. The study identified a significant positive correlation among self-efficacy scores, medication adherence scores, and four aspects of quality of life. The study concluded that patients with SLE demonstrated low flu vaccine uptake, suboptimal medication adherence, relatively low quality of life regarding the psychological domain score, and relatively high self-efficacy in managing chronic disease. Finally, the study revealed the need for effective communication between healthcare providers and patients regarding infection risks and benefits of flu vaccine.

Keywords: Adherence, Iraqi patients, Quality of life, Systemic lupus erythematosus, Self-efficacy.

Introduction

Systemic Lupus Erythematosus (SLE) is an inflammatory disorder marked by inflammation and immune-mediated injury to several organ systems. It is a chronic rheumatic disorder that predominantly affects women, with a prevalence ratio of 9-10:1[(1)]. SLE prevalence in Iraq was around 1 in 1867, with the first documented case in 1971 [(2)]. Currently, there is no remedy for SLE; existing medicines alter the illness progression, alleviate symptoms, and enhance survival rates. The treatments used for SLE encompass belimumab, corticosteroids, hydroxy-chloroquine, rituximab, immune-suppressive and immunomodulatory medicines , as well as nonsteroidal anti-inflammatory medications (NSAIDs) [(3)]. Medication adherence refers to 'the extent to which individuals comply with the prescribed medication regimens of their healthcare professionals' [(4)]. Factors such as low socioeconomic position, single status, adverse effects of medicine, disease flares , patient views , treatment awareness,

co-morbidities, insufficient physician guidance, and numerous daily medication regimens contribute to non-adherence to medications in individuals with SLE [5]. The World Health Organization (WHO) asserts that treatment success is predominantly influenced by adherence to therapy [4]. Non-adherence to SLE medication may lead to an increase in hospitalizations, a decline in autonomy and mobility, and, subsequently, a deterioration in life quality [6]. Some studies have focused on medication adherence in SLE. One systematic review study found that suboptimal adherence to SLE medications is a significant issue [7].

The WHO characterizes quality of life (QoL)as an individual's evaluation of their life conditions, taking into account their social and value systems, goals, standards, priorities, and challenges [8]. The persistent presence of pain in SLE is associated with exhaustion, anxiety, and depression, which, in addition to other symptoms, ultimately interfere with daily activities and affect their QoL [9]. The QoL in SLE patients is comparable to that in patients with other chronic conditions, such as Sjögren's syndrome, AIDS, or rheumatoid arthritis [10]. Poor quality of life can result in noncompliance with medications [11].

The patient's self-efficacy is a vital determinant affecting a treatment effectiveness and achieving its goals. Self-efficacy denotes an individual's conviction in their capacity to attain a particular objective, impacting their choices, persistence, and work performance. It also impacts cognitive and emotional conditions during task execution, enabling better chronic disease management [12]. Furthermore, it fosters the development of the necessary skills and confidence for individuals to manage their chronic conditions effectively [13]. A previous study have demonstrated that self-efficacy significantly impacts drug adherence among individuals with chronic conditions [14] . Another study aimed to evaluate the predictive impact of self-efficacy on quality of life. The study revealed that superior physical and mental components were anticipated by enhanced self-efficacy in symptom management, medication and treatment management, social interaction management, and overall self-efficacy [15].

In Iraq, a single study was conducted to evaluate medication adherence among Iraqi female patients with SLE and to identify the factors affecting adherence. The study indicated that the adherence rate was low, with younger age, low socioeconomic status, illiteracy, short disease duration, and side effects identified as significant predictors of non-adherence [16]. Additional studies were undertaken to evaluate patients' adherence to chronic conditions, including systemic rheumatic disorders and diabetes mellitus [17-21]. One study revealed that most ankylosing spondylitis patients adhered to their treatment [17]. Another study revealed that methotrexate non-adherence is prevalent among rheumatoid arthritis patients, influenced by several factors [18].

Regarding QoL, a study was conducted in Iraq to evaluate health-related quality of life (HRQOL) within SLE patients and found that all domains of quality of life had low scores [22]. A study examining the quality of life and treatment satisfaction among different groups of patients using various anticoagulant treatments found that patients who took warfarin experienced a quality of life comparable to those who took non-vitamin K antagonist oral anticoagulants [23]. Several studies evaluated QoL in various chronic conditions [24-27]. One study conducted to evaluate the quality of life found that patients with chronic hepatitis B had significantly worse quality of life scores compared to healthy control subjects across multiple domains [24]. Another study indicated that the quality of life of colorectal cancer patients receiving capecitabine was affected by their sociodemographic characteristics and the drug's adverse effects, implying a relationship between these variables [25].

Limited research evaluated self-efficacy in chronic diseases in Iraq [28-30]. A study to assess self-efficacy in patients with Type II Diabetes Mellitus indicated that the majority of them exhibit high self-efficacy [28]. A further study aimed at assessing the correlation between self-care and self-efficacy in patients with diabetes mellitus revealed that these patients demonstrated a moderate degree of self-efficacy alongside insufficient self-care practices [29]. To the authors' knowledge, no prior comparative studies have been conducted in Iraq to evaluate adherence, self-efficacy, and quality of life in individuals with SLE and its association with sociodemographic and clinical variables. This study evaluates medication adherence, quality of life, and self-efficacy in Iraqi patients with SLE, focusing on sociodemographic and clinical variables.

Subjects and Methods

Study design

The study had a cross-sectional and observational design, and was conducted in the Rheumatology department of Baghdad Teaching Hospital from November 2024 to January 2025.

Study population

The study population was a convenient sample of SLE patients who visited the Rheumatology Unit at Baghdad Teaching Hospital. This sampling technique was adopted due to the limited time of the study.

Patient selection criteria

The study participants comprised adult patients who met the following criteria. Participants had to be at least 18 years old and diagnosed with SLE according to the American College of

Rheumatology criteria for a minimum of 6 months, prescribed at least one specific SLE medication in addition to NSAIDs and corticosteroids for a minimum of 6 months. They could speak and understand Arabic and provided verbal consent that the ethical committee approved to participate in the study. The study's exclusion criteria encompassed patients with hearing, speech, or cognitive impairments that could hinder their comprehension of the questions, pregnant or breastfeeding women since these factors may influence disease activity and patients who provided incomplete responses.

Data collection

Data were acquired through in-person interviews with study participants following their consent. A data collection sheet was utilized to gather the necessary information for the investigation. This included sociodemographic factors such as age, sex, body mass index, level of education, marital status, employment status, smoking behavior, income, and influenza vaccination uptake for the past year and willingness to take it this year. Additionally, the clinical characteristics of the patients included physician visits, disease duration, the number of comorbid chronic conditions, the number of concurrent chronic medications, current treatment for SLE, and disease activity.

Adherence was assessed using the Arabic version of the Compliance Questionnaire for Rheumatology (CQR) [31]. It is a 19-item patient self-report tool that is able to reliably capture individuals in the "low" adherer category, taking less than 80% of their medication as advised and was initially developed in English. Patients rate all statements as an indication of their level of agreement or disagreement on a Likert scale ranging from 1 to 4 (4 = strongly agree, 3 = agree, 2 = disagree, and 1 = strongly disagree). Items 4, 8, 9, 11, 12, and 19 denote negative assertions indicating a reversal. A rating of 4 on a scale of 1 to 4 signifies substantial disagreement, whereas a rating of 1 denotes great agreement. Then, adding the items, deducting 19, and dividing by 0.57 to yield the overall score of the questionnaire. This verifies that the overall score of the questionnaire can range from 0 (total nonadherence) to 100 (optimal adherence). Reducing the scores, the worst adherence. Medication nonadherence was well-defined when the CQR score was below 80% [32].

The World Health Organisation Quality of Life (WHOQOL-BREF) questionnaire was used in Arabic to evaluate the quality of life [8]. The questionnaire comprised 26 items and produced scores in four domains relevant to quality of life: physical, psychological, social interactions, and environment. Responses were provided on a five-point scale regarding a two-week period. To determine the domain score (range, 4–20), the average of the items in each domain was multiplied by four. Higher scores indicate a better QoL and were initially created in English. There are no definite cut-off values above and below which quality of life can be described as "poor" or "good" [8].

The Self-Efficacy for Managing Chronic Disease 6-Item Scale (SEMCD) in Arabic was used to evaluate self-efficacy [33]. The scale developed by Lorig *et al.* in English assesses the confidence level among patients with chronic diseases in managing their conditions. It encompasses prevalent areas in chronic diseases, including emotional functioning, role functioning, physician communication, and symptom management. Each item is evaluated on a scale from 1 (not confident) to 10 (very confident). The total score of the scale is the mean of these six components. A higher score signifies an improvement in self-efficacy. A median cut-off of 33 was employed for scoring, with scores below 33 signifying poor self-efficacy and 33 or above indicating good self-efficacy [30, 34].

A physician assessed the disease activity of SLE using the Safety of Oestrogens in Lupus Erythematosus National Assessment and the Systemic Lupus Erythematosus Disease Activity Index score (SELENA-SLEDAI). It evaluates 24 disease descriptors, yielding a maximum score of 105, with 0-3 indicating inactive disease and>3 indicating disease is active. This index is crucial for clinical practice and research, as it reflects changes in disease activity over time and is sensitive to treatment responses. Key components assessed include renal function, neurological symptoms, and hematological parameters [35].

Statistical analysis

The study utilized version 25 of the Statistical Package for the Social Sciences (SPSS) software, and GraphPad Prism was used to develop figures. Descriptive statistics were conducted on each research variable. The frequencies and percentages were used to represent categorical variables, while the means ± standard deviation (SD) were used to represent continuous data. The disparities in continuous variables (adherence, quality of life, and self-efficacy) were assessed utilising an independent T-test for the clinical and sociodemographic attributes of the patients. One-way ANOVA was employed to analyze the differences in the means of target continuous variables based on the number of additional chronic conditions. Tukey's Honest Significant Difference (HSD) test was used after performing ANOVA test when a significant difference among group means was found. The Pearson correlation was employed to assess the correlations between the target continuous scores and various continuous patient factors. A P-value below 0.05 was deemed statistically significant.

Results

The study recruited 118 SLE patients (113 women and 5 men). The patient's average age was 35.0 (±10.5) years. More than three-quarters (76.3%) were married, 73.7% resided in urban regions, and 78.8% were unemployed. Almost half of them (49.2%) had a primary school education. Approximately three-quarters (74.6%) of them were low-income people with less than (500,000 IQD) monthly (Table 1). The vast majority (94.1%) of the patients did not receive the flu vaccine in the past year, (92.4%) were not willing to take it this year, and 84.7% visited a rheumatologist regularly. Approximately one-third (44.9%) had one or two other chronic diseases. The patients had severe disease activity; the average SELENA_SLEDAI value was 14.86 (±13.36) (Table 2). The most commonly used medications to treat SLE among the participating patients included hydroxychloroquine (91.5%) (Figure 1).

Table 1. The socio-demographic characteristics of the participants

Characteristics	Subgroups	Frequency (%)
Sex	Female	113 (95.8)
	Male	5 (4.2)
Social status	Married	90 (76.3)
	Un married	28 (23.7)
Education level	Illiterate	2 (1.7)
	Primary school	58 (49.2)
	Secondary school	45 (38.1)
	College degree	13 (11)
Residency	Rural	31 (26.3)
	Urban	87 (73.7)
Employment	Yes	25 (21.2)
	No	93 (78.8)
Exercise	Yes	27 (22.9)
	No	91 (77.1)
Cigarette smoking	Yes	6 (5.1)
	No	112 (94.9)
Alcohol consumption	No	118 (100.0)
Monthly income (Iraqi dinars)	Less than 500,000	88 (74.6)
	500,000- 1000000	27 (22.8)
	More than 1000000	3 (2.5)
	Range	**Mean (SD)**
Age (years)	19.0 – 61.0	35.03 (10.52)
BMI (kg/ m²)	17.78 – 78.11	28.54 (7.36)

Table 2. The clinical characteristics of the study participants

Characteristics	Subgroup	Frequency (%)
Received flu vaccine in the past year	Yes	7 (5.9)
	No	111 (94.1)
Willingness to take flu vaccine this year	Yes	9 (7.6)
	No	109 (92.4)
Doctor (Rheumatologist) visit	On need	18 (15.3)
	Regularly	100 (84.7)
No. of other chronic diseases	0	65 (55.1)
	1	36 (30.5)
	2	17 (14.4)

Continued table 2.

	Range	**Mean (SD)**
Disease duration (years)	1.0 – 22.0	6.13 (4.77)
*Disease activity (SELENA_SLEDAI value)	1 - 89	14.86 (13.36)
No. of chronic medications	1 - 10	3.81 (1.71)

*The SELENA-SLEDAI score varies from 0 to 105, with elevated scores signifying increased disease activity. This is a concise summary of the scoring system: 0-3: disease inactive; 4-12: Mild or moderate disease activity; >12 : sever disease activity.

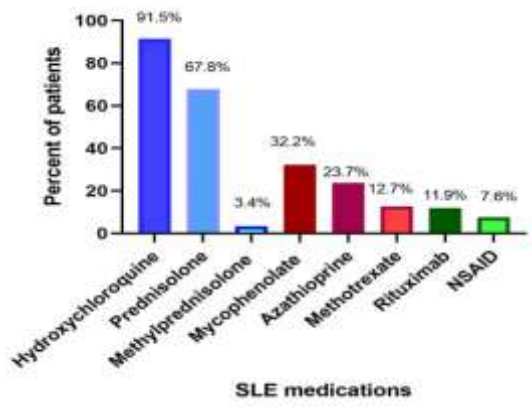

Figure 1: The medications prescribed to treat SLE among the participating patients. NSAID: Non-steroidal anti-inflammatory drugs

The average CQR score was 64.32, and only 12.7% of the patients had good adherence to their therapy. It is worth mentioning that three items of the CQR (adherence) scale received below-average scores. The first item was item number 8, with approximately 90.7% of the patients stating that they did not like medicine. In addition, the second item was item number 11, with 45.8% did not expect outcomes above clinically attainable limits. Furthermore, the third item was item number 16, with 61.9% of the patients did not use dose organizers (Table 3).

In contrast, three items of the CQR scale received the highest score and refer to better adherence includes item number 4, with 82.2% of the patients did not prefer alternative therapies to what their rheumatologist prescribes. In addition, the second item was item number 13, with 49.2% of the patients totally agreed that if they did not take their medicines, the inflammation would return. Furthermore, the third item was item number 18, with 53.4% of the patients taking their antirheumatic medicines to have fewer complaints (Table 3).

Table 3. Responses of the participants to the Compliance Questionnaire on Rheumatology (CQR)

No.	**CQR items**	**Totally disagree N (%)**	**Disagree N (%)**	**Agree N (%)**	**Totally agree N (%)**	**Mean (SD)**
1	If the rheumatologist tells me to take the medicines, I do so	14 (11.9)	7 (5.9)	30 (25.4)	67 (56.8)	3.27 (1.018)
2	I take my anti-rheumatic medicines because I then have fewer problems	5.0 (4.2)	2.0 (1.7)	64 (54.2)	47 (39.8)	3.30 (0.708)
3	I definitely don't dare to miss my anti-rheumatic medications	49 (41.5)	15(12.7)	12 (10.2)	42 (35.6)	2.40 (1.341)
4	If I can help myself with alternative therapies, I prefer that to what my rheumatologist prescribes *	97 (82.2)	14 (11.9)	3.0 (2.5)	4.0 (3.4)	3.73 (0.675)
5	My medicines are always stored in the same place and that's why I don't forget them	18 (15.3)	8.0 (6.8)	9.0 (7.6)	83 (70.3)	3.33 (1.133)

6	I take my medicines because I have complete confidence in my rheumatologist	5.0 (4.3)	9.0 (7.7)	38 (32.5)	65 (55.6)	3.39 (0.809)
7	The most important reason to take my anti-rheumatic medicines is that I can still do what I want to do	4.0 (3.4)	7.0 (5.9)	55 (46.6)	52 (44.1)	3.31 (0.736)
8	I don't like to take medicine. If I can do without them, I will *	4.0 (3.4)	2.0 (1.7)	5.0 (4.2)	107 (90.7)	1.18 (0.622)
9	When I am on vacation, it sometimes happens that I don't take my medicines *	62 (52.5)	19 (16.1)	8.0 (6.8)	29 (24.6)	2.97 (1.260)
10	I take my anti-rheumatic drugs, for otherwise what's the point of consulting a rheumatologist?	2.0 (1.7)	9.0 (7.6)	69 (58.5)	38 (32.2)	3.21 (0.652)
11	I don't expect miracles from my anti-rheumatic medicines *	8.0 (6.8)	23 (19.5)	33 (28)	54 (45.8)	1.87 (0.967)
12	If you can't stand the medicines you might say: "throw it away, no matter what" *	46 (39)	16 (13.6)	6.0 (5.10)	50 (42.4)	2.49 (1.376)
13	If I don't take my anti-rheumatic medicines regularly, the inflammation returns	1.0 (0.8)	8.0 (6.8)	51 (43.2)	58 (49.2)	3.41(0.657)
14	If I don't take my anti-rheumatic medicines, my body warns me	1.0 (0.8)	8 (6.8)	51 (43.2)	58 (49.2)	3.41 (0.6570
15	My health goes above everything else and if I have to take medicines to keep well, I will	12 (10.2)	5 (4.2)	25 (21.2)	76 (64.4)	3.40 (0.971)
16	I use a dose organizer for my medications	73 (61.9)	12 (10.2)	8 (6.8)	25 (21.2)	1.87 (1.237)
17	What the doctor tells me, I hang on to	19 (16.1)	27 (22.9)	35 (29.7)	37 (31.4)	2.76 (1.068)
18	If I don't take my anti-rheumatic medicines, I have more complaints	2.0 (1.7)	4.0 (3.4)	49 (41.5)	63 (53.4)	3.47 (0.650
19	It happens every now and them. I go out for the weekend, and then I don't take my medicines *	74 (62.7)	11 (9.3)	7.0 (5.9)	26 (22)	3.13 (1.251)
	CQR_total_score	**Minimum**	**Maximum**			**Mean (SD)**
		29.82	87.72			64.32(13.39)

CQR: Compliance questionnaire for rheumatology. *The item is reverse-coded. **N.** Number. **%.** Percentage.

Table 4.The adherence of the participating patients according to the CQR scale

CQR score	Frequency (%)
Patients with good adherence	15 (12.7)
Patients with poor adherence	103 (87.3)

Concerning the impact of demographic and clinical characteristics on adherence, the patients living in urban areas had significantly higher scores of medication adherence (CQR) in contrast to individuals residing in rural regions (Table 5). There was a significant negative correlation among the disease activity (SELENA_SLEDAI) besides medication adherence (CQR score). In other words, when medication adherence decreases, disease activity increases (Table 6).

Table 5. Difference in CQR scores according to the patient socio-demographic and clinical characteristics (Categorical Variables).

Categorical Variables	Subgroup	N	Mean (SD)	p-value
*Sex	Male	5	67.72 (15.12)	0.564
	Female	113	64.17 (13.36)	
*Social status	Married	90	64.66 (13.24)	0.622
	Un married	28	63.22 (14.05)	
*Residency	Urban	87	70.68 (8.27)	**0.000**
	Rural	31	46.46 (7.50)	
*Employment	Yes	25	64.84 (15.52)	0.826
	No	93	64.18 (12.84)	
*Doctor visit	On need	18	59.06 (14.14)	0.070
	Regularly	100	65.26 (13.10)	
† No. of other chronic diseases	0	65	63.05 (13.02)	0.242
	1	36	67.45 (13.86)	
	2	17	62.54 (13.43)	

*Significant at $p<0.05$ level according to independent t-test. † Significant at $p<0.05$ level according to one-way ANOVA test. N. Number

Table 6. Difference in CQR scores according to the patient socio-demographic and clinical characteristics (Continuous Variables).

Continuous Variables	Pearson's correlation coefficient	p-value
Age (years)	0.140	0.130
BMI kg/m2	0.030	0.745
Disease duration (years)	-0.008	0.934
SELENA_SLEDAI	-0.337	**0.000***
No. of chronic medications	0.084	0.363

*Significant correlation

Regarding QoL, the social domain of the QoL received the higher score (mean of 12.21 ±3.35), followed by the physical domain (mean of 10.64±3.61), while the psychological domain had the lowest score (mean of 9.9±3.1). (Table 7).

Table 7. Scores of the four domains of QoL for the study participants.

Domains of QoL	QOL Score [Mean (SD)]
Physical domain	10.64 (3.61)
Psychological domain	9.90 (3.07)
Social domain	12.21 (3.35)
Environment domain	10.37 (2.79)
Overall QOL	2.58 (1.11)
General Health Satisfaction	2.53 (1.27)

QOL: Quality of life.

Concerning the impact of demographic and clinical characteristics on QoL, the physical, psychological, and social quality of life domains were significantly elevated in individuals residing in urban regions compared to those in rural areas (Table 8). On the other hand, patients with SLE who were exercising had better psychological and social health compared to those have not exercised. In addition, patients without chronic diseases had significantly better physical QoL than patients with two chronic diseases. There was a significant negative correlation among the SLE disease activity (SELENA_SLEDAI) besides both physical and social QoL. In other words, physical and social QoL decreases when SLE disease activity increases (Table 9). Likewise, there was a significant negative correlation between the disease duration and physical QoL. Patient physical QoL decreases with longer SLE disease duration (Table 9).

Table 8. Difference in QOL scores according to the patient socio-demographic and clinical characteristics (Categorical Variables).

Variables	**Sub-categories**	**Physical domain Mean (SD)**	**P_ value**	**Psychological domain Mean (SD)**	**P_ value**	**Social domain Mean (SD)**	**P_ value**	**Environmental domain Mean (SD)**	**P_ value**
*Sex	Male	12.91 (4.51)	0.150	11.60 (3.48)	0.209	14.67 (2.83)	0.095	11.30 (3.17)	0.448
	Female	10.54 (3.55)		9.83 (3.05)		12.11 (3.34)		10.33 (2.78)	
*Social status	Married	10.83 (3.72)	0.300	10.01 (3.01)	0.485	12.07 (3.44)	0.416	10.36 (2.80)	0.958
	Un - married	10.02 (3.20)		9.55 (3.31)		12.67 (3.09)		10.39 (2.83)	
*Residency	Urban	11.35 (3.47)	**0.000***	10.32 (2.96)	**0.013***	12.71 (3.14)	**0.007***	10.62 (2.65)	0.101
	Rural	8.65 (3.24)		8.73(3.12)		10.84 (3.59)		9.66 (3.09)	
*Employment	Yes	11.15 (3.81)	0.423	10.19 (3.31)	0.607	11.73 (3.71)	0.421	11.24 (3.39)	0.139
	No	10.50 (3.56)		9.83 (3.02)		12.34 (3.26)		10.13 (2.58)	
*Doctor visit	On need	9.71 (3.78)	0.239	9.56 (3.21)	0.603	12.30 (3.02)	0.911	10.94 (2.84)	0.344
	Regularly	10.81 (3.57)		9.97 (3.06)		12.20 (3.42)		10.27 (2.78)	
*Exercise	Yes	11.03 (3.91)	0.527	11.04 (3.11)	**0.029***	13.58 (3.20)	**0.015***	11.11 (3.13)	0.116
	No	10.52 (3.52)		9.57 (3.00)		11.81 (3.31)		10.15 (2.66)	
†No. of other chronic diseases	0	11.15 a (3.39)	**0.044***	10.09 (2.95)	0.732	12.47 (2.78)	0.345	10.16 (2.55)	0.668
	1	10.63 a (3.84)		9.76 (3.29)		12.26 (3.67)		10.58 (2.96)	
	2	8.71 b (3.44)		9.49 (3.18)		11.14 (4.50)		10.71 (3.39)	

*Significant at $p<0.05$ level according to independent t-test. † Significant at $p<0.05$ level according to one-way ANOVA test.

Table 9.Difference in QOL scores according to the patient socio-demographic and clinical characteristics (Continuous Variables)

	Pearson's correlation coefficient	p-value	R	p-value	R	p-value	R	p-value
Age (years)	0.131	0.390	0.062	0.505	-0.038	0.683	0.056	0.550
BMI kg/m2	-0.053	0.568	-0.013	0.891	-0.101	0.276	0.033	0.721
Disease duration (years)	-0.202	**0.028***	-0.126	0.174	-0.121	0.193	-0.044	0.633
SELENA-SLEDAI	-0.359	**0.000***	-0.166	0.072	-0.228*	**0.013**	-0.083	0.372
No. of chronic medications	-0.082	0.379	0.085	0.360	-0.077	0.408	0.074	0.429

R. Pearson's correlation coefficient. *Significant correlation

Regarding self-efficacy, the participants' responses to the SEMCD questionnaire items are presented in Table 10. The current study's findings show that the mean SEMCD score for all participants was 39.88±9.79, pertaining to self-efficacy

Table 10. Responses of the participants to the SEMCD questionnaire

SEMCD items	Minimum	Maximum	Mean (SD)
1. Confidence to reduce fatigue interfering	1	10	6.90 (2.05)
2. Confidence to reduce pain interfering	1	10	6.56 (2.03)
3. Confidence to reduce emotional distress interfering	1	10	6.02 (2.23)
4. Confidence to reduce other symptoms interfering	2	10	6.96 (1.92)
5. Confidence to reduce the need to see the doctor	1	10	6.74 (1.90)
6. Confidence to reduce illness effects on life	1	10	7.90(10.04)
SEMCD_total	9.00	55.00	39.88 (9.79)

SEMCD: Self-efficacy for managing chronic diseases

The residency significantly influenced self-efficacy; patients living in urban settings had superior medication adherence and quality of life and considerably enhanced self-efficacy compared to their rural counterparts (Table 11). The disease activity (SELENA_SLEDAI) had a significant negative correlation with self-efficacy scores. In other words, patients with diminished self-efficacy in managing chronic disease had more severe SLE. (Table 12)

Table 11. Difference in SEMCD scores according to the patient socio-demographic and clinical characteristics (Categorical Variables)

Categorical Variables	Subgroup	N	Mean (SD)	p-value
*Sex	Male	5	46.60 (5.22)	0.117
	Female	113	39.58 (9.85)	
*Social status	Married	90	39.21 (9.80)	0.183
	Un married	28	42.04 (9.60)	
*Residency	Urban	87	41.36 (8.47)	**0.021***
	Rural	31	35.74 (11.99)	
*Employment	Yes	25	41.56 (11.53)	0.336
	No	93	39.43 (9.82)	
*Doctor visit	On need	18	39.22 (11.32)	0.758
	Regularly	100	40.00 (9.54)	
†No. of other chronic diseases	0	65	41.15 (8.06)	0.200
	1	36	39.14 (10.26)	
	2	17	36.59 (13.80)	

*Significant at p<0.05 level according to independent t-test. † Significant at p<0.05 level according to one-way ANOVA test. **N.** Number.

Table 12. Difference in SEMCD scores according to the patient socio-demographic and clinical characteristics (Continuous Variables)

Continuous variables	Pearson's correlation coefficient	p-value
Age (years)	0.080	0.390
BMI kg/m2	0.059	0.523
Disease duration (years)	-0.060	0.517
SELENA_SLEDAI	-0.360	**0.000***
No. of chronic medications	-0.157*	0.09

*Significant correlation

There were significant positive correlations between the four domains of the QoL and patients' adherence and self-efficacy (Table 13). Patients exhibiting elevated medication adherence and self-efficacy had superior quality of life across four domains: physical, psychological, social, and environmental. Also, patients exhibiting elevated self-efficacy are correlated with increased treatment adherence (Table 13).

Table 13.The correlation between patients' self-efficacy, medication adherence, and QoL.

QoL score		CQR score	SEMCD score
Physical domain	r	0.354**	0.273**
	p-value	**0.000**	**0.003**
Psychological domain	r	0.303**	0.344**
	p-value	**0.001**	**0.000**
Social domain	r	0.230*	0.277**
	p-value	**0.012**	**0.002**
Environment domain	r	0.211*	0.301**
	p-value	**0.022**	**0.001**
SEMCD-total	r	0.341**	
	p-value	**0.000**	

r. Pearson Correlation

Discussion

Adherence to treatment is essential for managing SLE. Inadequate adherence might result in heightened disease exacerbations, increased morbidity, hospitalizations, and worse renal outcomes [(36)]. Enhancing adherence and symptom management can elevate QoL by diminishing disease activity and organ impairment. Consequently, it is essential to address both adherence and quality of life for efficient management of SLE [(37)]. Medication nonadherence is prevalent in SLE, with factors such as diminished patient self-efficacy contributing to this phenomenon [(38)]. For this reason, this study was carried out to evaluate medication adherence, QoL, and self-efficacy among Iraqi individuals with SLE and ascertain the clinical and demographic features that may influence these variables.

The current study showed that flu vaccination uptake among SLE patients in the past year was very low (5.9%). This result is similar to that of a previous study, which showed that the flu vaccination rate among SLE patients was only about 8.3% [(39)]. The inadequate vaccination rate may be due to various causes, such as insufficient medical advice, apprehensions over vaccine safety and efficacy, and widespread vaccine hesitancy among patients [(39)].

The study findings revealed that only 12.7% of study participants had good adherence to their treatment, with a mean score of 64.32. This result is in concordance with a study conducted by Alahmadi *et al.* in Iran, which revealed that 18.7% of SLE patients exhibited high adherence to their drug regimen [(40)]. Non-adherence to medications among SLE patients was influenced by factors such as low socioeconomic status, medication adverse effects, disease flares, treatment awareness, co-morbidities, and inadequate physician guidance [(5)].

Concerning the impact of demography on medication adherence, the patients living in urban areas had significantly higher scores of medication adherence compared to individuals residing in rural regions, which may be due to better access to healthcare services and education. In contrast, another study conducted on Chinese patients with SLE demonstrated that residency was not linked to medication non-adherence [(41)].

Moreover, the present study identified a significant inverse correlation between disease activity and medication adherence. Inadequate adherence to the prescribed treatment regimen may

exacerbate the condition's progression. These findings were similar to previous studies, which showed that good adherence to therapy was associated with a low SELENA_SLEDAI score [42].

Concerning QoL, the psychological health score was the lowest, whereas the social health score was the greatest since rheumatic diseases are regarded as stressors. Rheumatic diseases can significantly impact a patient's mood and psychosocial functioning [43]. In contrast, the SLE study conducted in Brazil revealed that the physical health score was the lowest and the social health score was the highest [44].The current study's finding that residence had a significant correlation with physical, psychological, and social health scores agreed with another study conducted in Iraq, which revealed inferior QoL in SLE patients within the physical health domain for individuals residing in urban areas [22]. This may be due to rural patients often facing socioeconomic disadvantages, higher disease activity, and limited access to healthcare resources, leading to poorer health outcomes and disability and worse overall QoL, exacerbated by lower education and employment rates [45].

The current study's findings indicated that patients with SLE who engaged in exercise exhibited superior psychological and social health compared to those who did not. This finding was compatible with a previous study, which suggests that after six weeks of consistent exercise, numerous SLE participants experienced diminished depression symptoms and enhanced physical health [46].

Comorbidities were found to significantly diminish the physical domain of QoL in the present study. This may be because comorbidities significantly impact QoL in various patient populations, affecting physical health, emotional well-being, and daily functioning. Severe comorbidities lead to mobility and self-care challenges, exacerbating overall health status [47].

The present study revealed a significant inverse correlation between disease duration and the physical aspect of QoL, suggesting that QoL scores diminished as disease duration increased. This finding was similar to previous studies conducted among SLE patients, which identified a statistically significant inverse association between disease duration and patients' QoL [48]. This may be due to SLE patients experiencing fatigue, pain, and functional limitations that worsen over time. This leads to increased emotional distress, physical impairments, and reduced physical functioning, affecting overall QoL and daily activities [49].

The current study revealed a significant negative correlation between SELENA-SLEDAI and the physical and social aspects of QoL due to the incapacitating symptoms associated with active disease. This finding was in line with a study conducted in Egypt among patients with SLE, which indicated that QoL is adversely affected by disease activity [50].

Regarding self-efficacy, the study indicated that it is relatively high. This may be due to chronic SLE patients learn coping mechanisms, increase self-efficacy, and improve symptom recognition and response skills through adaptation and repeated exposure. This finding was compatible with the study conducted among patients with autoimmune disorders across diverse age cohorts and levels of education had a high degree of self-efficacy [51].

Concerning the impact of demography on self-efficacy, the present study demonstrated a signification correlation between self-efficacy and residency, which was in line with another study that revealed the mean score of urban residents was greater than that of rural residents [52]. The distinction between urban and rural residency markedly impacts one's self-efficacy when managing chronic illnesses. Rural inhabitants frequently encounter obstacles such as restricted access to healthcare and diminished self-management tools, resulting in less self-efficacy than their urban counterparts [53].

Furthermore, the current study revealed a negative correlation between SELENA_SLEDAL and self-efficacy. This result may be because when the patients have less ability to manage their chronic condition and daily tasks lead to an increase in disease activity, which aggravates emotional suffering, exacerbates symptoms like fatigue, pain, and organ involvement.

The finding of the current study demonstrated a significant correlation between self-efficacy and medication adherence, as well as the four categories of QoL, suggesting that patients exhibiting greater self-efficacy in managing chronic conditions and medication adherence experienced enhanced QoL across the physical, psychological, social, and environmental domains. This may be because self-efficacy refers to a patient's confidence in efficiently treating their illness. Enhanced self-efficacy, resulting in improved self-management behaviors, encourages consistent treatment adherence, effective symptom management, and enhanced disease control, which leads to diminishing illness consequences and enhancing QoL among patients with SLE [15]. These findings align with a study indicating that diminished self-efficacy among SLE patients was associated with ongoing drug nonadherence, which was widespread in these patients [38]. Moreover, adhering to therapy regimens is significantly associated with overall QoL, emphasizing the vital roles that adherence plays in the best possible management of SLE. A study conducted in Egypt examining the correlates of health-related quality of life in patients with SLE found a significant positive association between overall QoL and total adherence [48].

Limitations of the Study

Several restrictions accompanied this study. The cross-sectional design of this study impedes the identification of causal links among the variables related to the employed scales. Future longitudinal or experimental studies are advised to address this issue. In addition, the respondents may have selected their responses to gain better scores, leading to misleading responses and, by extension, inflated or unrepresentative results. To mitigate this effect, participants were guaranteed confidentiality and anonymity throughout the data gathering process. In addition, the methodology employed to gather data through in-person interviews may have introduced the bias of the interviewer into the results. Moreover, convenience sampling, sample size, time, and single-center reliance to find patients are all considered the limitations of this study. These factors may influence the generalizability of the results. Future research should incorporate multi-center sampling with bigger and more heterogeneous populations over a longer duration.

Conclusion

Individuals with SLE had low flu vaccine uptake, suboptimal treatment adherence, and relatively high self-efficacy. Although SLE affects every aspect of quality of life, it most significantly impacts psychological well-being. The study showed positive correlations between the four domains of the QoL and patients' adherence and self-efficacy.

Recommendation

The study findings indicate an increasing focus on vaccination in SLE patients, highlighting the necessity of communication between healthcare providers and patients and educating patients about infection risks and benefits of flu vaccine. Furthermore, augmenting patient education to enhance medication adherence and improve self-efficacy in managing chronic disease can positively impact treatment outcomes and, hence, patient quality of life.

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Conflicts of Interest

None declared.

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Ethics Statements

Approval was obtained from the Scientific and Ethical Committee of the College of Pharmacy, University of Baghdad (approval number: REC062409S) and the Ministry of Health, Baghdad Teaching Hospital. Patients gave verbal consent for participation in the current study.

Author Contribution

Study conception and design: (Roaa Tahseen Al-Mandalawi & Basma Zuheir Al-Metwali). Data collection (Roaa Tahseen Al-Mandalawi & Faiq Isho Gorial). Analysis and interpretation of results (Roaa Tahseen Al-Mandalawi & Basma Zuheir Al-Metwali). Draft manuscript preparation: (Roaa Tahseen Al-Mandalawi & Basma Zuheir Al-Metwali). All authors reviewed the results and approved the final version of the manuscript.

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تقييم الالتزام وجودة الحياة والكفاءة الذاتية لدى المرضى العراقيين المصابين بداء الذئب الاحمراري:دراسة لمركز واحد

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الخلاصة

داء الذئب الاحمراري هو مرض مناعي مع اعراض شديدة وتلف بالانسجة. لا يزال الالتزام بالعلاج لدى مرضى داء الذئب الاحمراري يمثل مشكلة كبيرة ، ويمكن أن يؤدي عدم الالتزام إلى نتائج مرضية سيئة وانخفاض نوعية الحياة. تعد الكفاءة الذاتية أيضا جانبا مهما من جوانب السيطرة على المرض والالتزام بالأدوية. تهدف هذه الدراسة الى تقييم الالتزام بالأدوية ونوعية الحياة والكفاءة الذاتية بين مرضى داء الذئب الاحمراري وارتباطها بالعوامل الاجتماعية والديموغرافية والسريرية. أجريت دراسة مقطعية في وحدة أمراض الروماتيزم في مستشفى بغداد التعليمي في الفترة من تشرين الثاني ٢٠٢٤ إلى كانون الاول ٢٠٢٥ ، لتقييم لالتزام بالعلاج ونوعية الحياة والكفاءة الذاتية بين مرضى المصابين بداء الذئب الاحمراري باستخدام استبيان الامتثال لامراض الروماتزم واستبيان جودة الحياة الصادر عن منظمة الصحة العالمية واستبيان الكفاءة الذاتية لادارة الامراض المزمنة المتكون من ٦ عناصر على التوالي, بالاضافة الى قياس نشاط المرض. شملت الدراسة ١١٨ فردا تتراوح أعمارهم بين(٣٥,٠٣±١٠,٥٢) عاما في المتوسط ، و ٩٤,١٪ لم يتلقوا لقاح الإنفلونزا في العام الماضي. كان متوسط الالتزام بالعلاج (٦٤,٣٢) ونسبة المرضى الملتزمين بالعلاج(% ١٢,٧), وكانت الدرجة النفسية لجودة الحياة عند الحد الادنى لقيمتها البالغة (٩,٩٠) بينما وصلت الدرجة الاجتماعية الى الحد الاقصى للقيمة (١٢,٢١), وكان متوسط الكفاءة الذاتية (٣٩,٨٨).ترتبط درجة الالتزام ارتباطا كبيرا بالإقامة ونشاط المرض. بالإضافة إلى ذلك ، أظهرت درجات جودة الحياة ارتباطا كبيرا بالإقامة والتمارين الرياضية ونشاط المرض ومدة المرض وعدد الأمراض المزمنة. ترتبط درجة الكفاءة الذاتية أيضا بالإقامة ونشاط المرض. حددت الدراسة ارتباطا إيجابيا كبيرا بين درجات الكفاءة الذاتية ودرجات الالتزام بالأدوية وأربعة جوانب من جودة الحياة. أظهر المرضى الذين يعانون من مرض داء الذئب الاحمراري منخفضا لاخذ لقاح الإنفلونزا ، والالتزام بالأدوية دون المستوى الأمثل ، ونوعية حياة منخفضة نسبيا فيما يتعلق بدرجة المجال النفسي ، وكفاءة ذاتية عالية نسبيا في إدارة الأمراض المزمنة. كشفت الدراسة عن الحاجة إلى التواصل الفعال بين مقدمي الرعاية الصحية والمرضى فيما يتعلق بمخاطر العدوى وفوائد لقاح الإنفلونزا.

الكلمات المفتاحية: الالتزام بالعلاج ، المرضى العراقيون ، جودة الحياة،داء الذئب الاحمراري، الكفاءة الذاتية.