Research article

Prevalence of depression and its associated factors among patients with systemic lupus erythematosus at the Kenyatta National Hospital, Nairobi, Kenya

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Abstract

Background: Systemic Lupus Erythematosus (SLE) is a chronic autoimmune disease characterized by inflammation of various organs. Neuropsychiatric manifestations such as symptoms of depression may precede SLE, occur concomitantly, or follow its diagnosis. Depression often exacerbates the morbidity of SLE in these patients and lowers their quality of life. Depression is not routinely evaluated in patients with SLE in Kenya, which can lead to a reduction in its treatment and potentially worsen the morbidity of the disease.

Objective: This study aimed to determine the burden and determinants of depression in patients with SLE in Kenya.

Methods: A descriptive cross-sectional study was conducted at the rheumatology clinic in the Kenyatta National Hospital from November 2022 to January 2023. Depression was evaluated using the Patient Health Questionnaire 9. Data analysis was performed using IBM SPSS Version 25. The prevalence of depression was determined by calculating the proportion of participants who reported depression, and the association between depression and sociodemographic variables was assessed using the Chi-square test at a 95% confidence level. A probability value of <0.05 was considered significant.

Results: Fifty-five SLE patients were recruited in the study. Depression symptoms were reported among 24/55 (43.6%) of patients.

Conclusion: A high prevalence of depression was noted in patients with SLE. The afflicted had significant role limitations due to emotional problems, poor physical functioning, and poor health change. This study highlights the importance of evaluating and addressing depression in patients with SLE.

Key words: Systemic lupus erythematosus, Depression, Mental health

Introduction

Systemic Lupus Erythematosus (SLE) is a chronic autoimmune disease of unknown origin that can affect most organs[1]. Even though there is no cure for SLE, the disease is manageable with drugs and lifestyle changes[2] and by minimizing exposure to heavy metals pesticides, and solvents[3]. Systemic lupus erythematosus has a female predilection and is more common among non-Caucasians[4]. About 0.1-1.7% of black Africans in sub-Saharan Africa (SSA) are afflicted[5]. It is a complex condition with variable presentations and unpredictable courses.

Besides the physical manifestations of SLE, patients often experience significant psychological distress, including depression, anxiety, and diminished quality of life. These neurologic and neuropsychiatric symptoms may precede SLE, occur concomitantly with SLE, or follow the diagnosis of SLE, and often lower the quality of life of the affected patients[6]. The prevalence of depression among patients diagnosed with SLE, for instance, ranges between 24.4% and 91.7% with developing/low-income countries reporting the highest prevalence[7–10].

Depression in SLE may be influenced by a multitude of factors, including biological, psychological, and social determinants. Some risk factors for depression, identified in select studies, include low economic status, SLE disease activity, steroid drug use, and self-reported anxiety[11–17]. The knowledge of these risk factors is essential for identifying at-risk individuals and implementing targeted interventions. Stressful life events, including financial difficulties, relationship problems, unemployment,

and stigma associated with chronic illness, can precipitate or exacerbate depression in SLE patients. Depressed SLE patients have also been shown to have poor self-image, poor emotional health, and poor physical health[18].

Data from African and other low resource settings is minimal, making comparisons difficult. This highlights the need for epidemiological data from Africa. At the Kenyatta National Hospital (KNH), the burden of depression in patients with SLE is not routinely evaluated. This data would contribute to the development of strategies for early detection and management of depression to improve quality of life. Therefore, this study aims to fill this gap by investigating the prevalence and factors associated with depression among SLE patients attending the rheumatology clinic at Kenyatta National Hospital.

Materials and methods

A descriptive cross-sectional study was conducted at Kenyatta National Hospital (KNH) between November 2022 and January 2023. Participants were recruited at the rheumatology clinic and relevant data collected prospectively. This study targeted adult patients with SLE on follow-up at the KNH rheumatology clinic. Only patients who were aged 18 years or older, whose SLE diagnosis met either the ACR/SLICC criteria and who provided written informed consent were included into the study. Patients diagnosed with mixed connective tissue disease were excluded. Written consent forms were provided in English and Kiswahili and were administered by all patients who were willing to participate.

The study instrument was a questionnaire in two sections. The first section documented selected patient characteristics such as; age, gender, duration of SLE, weight in kilograms, height in meters, Body Mass Index (BMI), photosensitivity, skin changes, and the treatment modalities (steroidal, non-steroidal, and steroid-sparing agents such as antimalarial drugs). The second section incorporated the PHQ 9 questionnaire for evaluating depression. The PHQ-9 is a self- administered questionnaire, adapted from the PRIME-MD diagnostic instrument for mental disorders. The tool consists of nine questions, each one scored using the DSM-IV criteria on a three scale Likert ("not at all" =0 to "nearly every day" =3). The PHQ-9 has a one factor structure and has demonstrated adequate reliability (Cronbach alpha = 0.892)[19], sensitivity (88%) and specificity (85%)[20], and internal consistency (ICC = 0.880 and test-retest reliability (correlation = 0.94)[21] after psychometric analyses. A validated Kiswahili version of the 9-item PHQ-9 questionnaire is available[22].

Depression was evaluated using the PHQ 9 and the status of participants reported either as depressed or not depressed at a cutoff score of 10. Depression was further categorized as being either mild, moderate, or severe based on individual PHQ 9 scores.

Consecutive sampling was used to recruit participants. After informed consent, patients were led into a quiet room in the rheumatology unit where one- on-one interviews were conducted. The questions were read verbatim and responses recorded in questionnaires. The main data that was collected included socio-demographic information such as gender, education level, and age. Anthropometric data was abstracted from patient files and depression symptoms of participants evaluated using PHQ-9. Ethical approval was sought from the KNH/ERC Ethics Review Committee (ERC) before the study was started. Only data collection tools and the study protocol that were approved by the KNH-UoN ERC were used in the definitive study.

Data was uploaded into an SPSS version 25, checked for typing errors, missing data, and outliers and cleaned. Demographic factors were summarized using frequency distributions and percentages if categorical or as means with standard deviations if continuous. The prevalence of depression was determined by calculating the proportion of participants with depression while the association between depression and patient factors were determined using the Chi-square test for categorical patient factors at 95% confidence interval ($p < 0.05$).

Results

The demographic and clinical characteristics of adult patients with Systemic Lupus Erythematosus (SLE) attending the Kenyatta National Hospital Rheumatology Clinic in 2022 are summarized in Table 1. Fifty-five participants were recruited at the KNH rheumatology clinic between November 2022 and February 2023. The median age (interquartile range) was 33 (27- 42) years. The majority of patients were female (98.2%), with a notable proportion being married (60.0%) and having attained tertiary education (47.3%). Most patients had been diagnosed with SLE for less than five years (74.5%), and the distribution of Body Mass Index (BMI) categories indicated that the majority had a normal BMI (56.4%). Skin changes were present in half of the patients, with hyperpigmentation being the most common manifestation. Photosensitivity and a history of drug use, particularly hydroxychloroquine (75%) and prednisolone (75%) were commonly prescribed drugs.

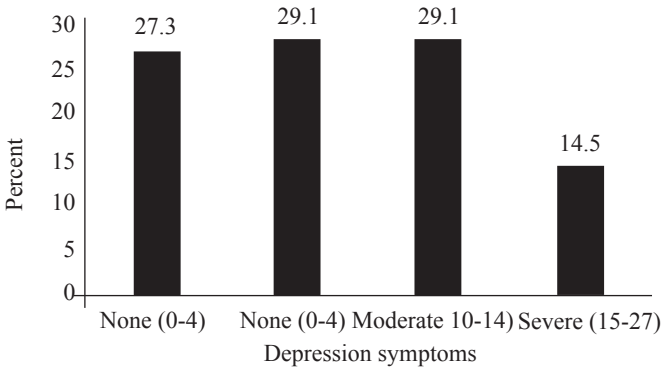
Table 1: Demographic and clinical characteristics of adult patients with SLE

Variables	Categories	No. (%)
Gender	Male	1 (1.8)
	Female	54 (98.2)
Marital status	Single	16 (29.1)
	Married	33 (60.0)
	Separated/Widowed/Divorced	6 (10.9)
Highest education level	No formal education	2 (3.6)
	Primary	6 (10.9)
	Secondary	21 (38.2)
	Tertiary	26 (47.3)
Duration with SLE	<5 years	41 (74.5)
	≥5 years	14 (25.5)
Body Mass Index	Underweight	7 (12.7)
	Normal	31 (56.4)
	Overweight	12 (21.8)
	Obese	5 (9.1)
Skin changes present		28 (50.9)
	Hyperpigmentation	13 (46.4)
	Blisters	5 (17.9)
	Hypopigmentation	4 (14.3)
	Wounds	4 (14.3)
	Scars	3 (10.7)
	Vesicles	1 (3.6)
	Eczema	1 (3.6)
	Aphthous ulcer	1 (3.6)
Photosensitivity	Present	31 (56.4)
	Absent	24 (43.6)
History of drug use		52 (94.5)
	Hydroxychloroquine (HCQ)	39 (75.0)
	Prednisolone	39 (75.0)
	Mycophenolate mofetil (MMF)	8 (15.4)
	Azathioprine	9 (17.3)
	Other drugs*	15 (28.8)

*Osteocare, Folic acid, Bisoprolol, Losartan, Cyclosporine, Esomeprazole, Amlodipin, Omeprazole, Warfarin, Atoravstatin, Telmisartan

Figure 1 illustrates the prevalence of depression symptoms among patients with SLE at Kenyatta National Hospital. Among the participants, 16 (29.1%), 16, and 8 (14.5%) had mild, moderate, and severe symptoms of depression respectively. Assuming a cut-off score of 10, 24 (43.6%) of the 55 partcipants could be classified as depressed based on the PHQ 9 questionnaire.

Figure 1: Prevalence of depression symptoms among patients with SLE at KNH



Prevalence by demographic biodata is presented in Table 2. Patients who had skin changes were 3.17 times more likely to be depressed (95% CI=1.09-8.94, p = 0.039). Photosensitivity increased the odds of depression by 9.09 times (95% CI=2.48-28.2, p <0.001), while skin rashes increased the odds of depression by 6.86 times (95% CI=2.09-22.5, p = 0.001). There was no difference in the prevalence of depression by age, gender, education, the duration of SLE, and medication use.

Table 2: Prevalence of depression symptoms among adult SLE patients on follow up at Kenyatta National Hospital Rheumatology clinic in 2022 by demographic data

		Depression symptoms			
Biodata		Present N=24	Absent N=31	OR (95% CI)	P-value
Age, years	MED (IQR)	33.5 (27.3-41.3)	33 (27-42)		0.905
Gender	Male	1 (100)	0 (0.0)	reference	
	Female	23 (42.6)	31 (57.4)	-	-
Marital status	Single	7 (43.8)	9 (56.3)	1.06 (0.31-3.26)	0.922
	Married	14 (42.4)	19 (57.6)	reference	
	Separated	3 (50.0)	3 (50.0)	1.36 (0.28-6.46)	0.731
Education	Non formal	1 (50.0)	1 (50.0)	1.00 (0.05-20.3)	1.000
	Primary	2 (33.3)	4 (66.7)	0.50 (0.09-2.66)	0.461
	Secondary	8 (38.1)	13 (61.9)	0.62 (0.20-2.08)	0.412
	Tertiary	13 (50.0)	13 (50.0)	reference	
SLE duration	<5 years	17 (41.5)	24 (58.5)	reference	
	5+ years	7 (50.0)	7 (50.0)	1.41 (0.42-4.77)	0.578
BMI	Underweight	1 (14.3)	6 (88.7)	0.20 (0.02-1.67)	0.131
	Normal	14 (45.2)	17 (54.8)	reference	
	Overweight	6 (50.0)	6 (50.0)	1.21 (0.36-4.09)	0.775
	Obese	3 (60.0)	2 (40.0)	1.82 (0.33-11.2)	0.537
Skin change	Yes	16 (57.1)	12 (42.9)	3.17 (1.09-8.94)	0.039
	No	8 (29.6)	19 (70.4)	reference	
Photosensitivity	Present	20 (64.5)	11 (35.5)	9.09 (2.48-28.2)	<0.001
	Absent	4 (16.7)	20 (83.3)	reference	
Skin rashes	Present	16 (69.6)	7 (30.4)	6.86 (2.09-22.5)	0.001
	Absent	8 (25.0)	24 (75.0)	reference	
Drug use	Yes	23 (44.2)	29 (55.8)	1.59 (0.17-23.9)	0.771
	No	1 (33.3)	2 (66.7)	reference	

Discussion

The prevalence of depression among patients with Systemic Lupus Erythematosus (SLE) has been a subject of considerable interest and debate. This was evaluated in a sample of 55 adult SLE patients on follow up at Kenyatta National Hospital (KNH) rheumatology clinic using self- administered interviews. Most of the recruited participants were well educated, overweight or obese and had SLE-related complications of the skin and the eyes, mostly rashes, blisters, hyperpigmentation of the skin, and photosensitivity.

The data showed that a significant proportion of patients with SLE had depression symptoms such as changes in mood and affect and growing thoughts of self-harm. Four out of 10 of the SLE patients had significant depression according to the PHQ 9 cut-off. Comparing our results to existing literature, our findings align with previous studies that have reported a high prevalence of depression in SLE patients. Moustapha *et al*[9] found a prevalence range of 24.4- 41.4% in a systematic review of individual studies. Garcia *et al*[23] reported a prevalence of 50.4% in a sample of 89 SLE patients from Spain using a Goldberg scale, while Maneeton *et al*[8], Abd-Alrasool *et al*[7] and Khedr *et al*[24] reported a prevalence of 45.2%, 31.7%, and 46.9% in China, Iraq, and in Egypt, which were more or less similar to what we found in this study at KNH in Kenya. These corroborate our findings and highlight the global burden of mental health issues in SLE.

Although the majority of affected patients reported moderate to mild depression, more than 10% had signs of severe depression. This is higher than the rate of severe depression for other chronic conditions, but comparable to other findings that have been reported in studies conducted all over the world[6,7].

Another key finding from the study is the significant association between cutaneous manifestations of SLE and depression symptoms. In particular, the only statistically significant association with depression in terms of patient variables was the presence of photosensitivity and skin rashes. These were related with a higher probability of depression – 64.5% and 69.6% respectively. Our findings echo the sentiments of previous research, as elucidated by Yew *et al*[25], who emphasized the psychosocial impact of dermatological symptoms. The visible nature of skin changes in SLE not only serves as a tangible reminder of the disease but also carries profound psychological implications, potentially contributing to feelings of self-consciousness, stigmatization, and diminished quality of life. Photosensitivity, a hallmark feature of SLE, not only also exacerbates these cutaneous manifestations but also embodies the intricate relationship between environmental triggers and disease activity.

Intriguingly, while certain demographic and clinical variables demonstrated significant associations with depression symptoms in our study, others did not yield statistically significant findings. Our study did not identify a significant association between SLE duration and depression symptoms in corroboration with previous literature[26]. While the absence of a statistical association may temper the notion of disease duration as a deterministic factor, it prompts reflection on the nuanced nature of disease trajectories and individual variability.

Moreover, the lack of significant associations between depression symptoms and variables such as age, gender, and medication use challenges conventional assumptions and underscores the multifactorial nature of depression in SLE. Our findings resonate with those of multiple other studies[12,27], which emphasized the heterogeneity of depressive symptoms in SLE patients. A holistic approach that considers the complex interplay of biological, psychological, and social factors in shaping mental health outcomes should be considered.

Hence, there is a need to reconsider how adult SLE patients are managed during routine clinical visits in Africa. Surveillance systems for chronic mental health conditions such as depression are lacking in public hospitals in low to middle income countries such as Kenya. At KNH, for instance, robust surveillance systems for patients who have SLE and skin and eye complications such as rashes, blisters or photosensitivity can pick up such cases early and consequently improve their wellness.

Declaration

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References

1. Justiz Vaillant AA, Goyal A, Varacallo M. Systemic Lupus Erythematosus. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2023 [cited 2023 May 28]. Available from: http://www.ncbi.nlm.nih.gov/books/NBK535405/
2. Fava A, Petri M. Systemic lupus erythematosus: Diagnosis and clinical management. *J Autoimmun*. 2019; **96**:1–13.
3. Parks CG, de Souza Espindola Santos A, Barbhaiya M, Costenbader KH. Understanding the role of environmental factors in the development of systemic lupus erythematosus. *Best Pract Res Clin Rheumatol.* 2017; **31**(3):306–320.
4. Pons-Estel GJ, Ugarte-Gil MF, Alarcón GS. Epidemiology of systemic lupus erythematosus. *Expert Rev Clin Immunol*. 2017; **13**(8):799–814.

5. Essouma M, Nkeck JR, Endomba FT, Bigna JJ, Singwe-Ngandeu M, Hachulla E. Systemic lupus erythematosus in Native sub-Saharan Africans: A systematic review and meta-analysis. *J Autoimmun*. 2020; **106**:102348.
6. Gulinello M, Wen J, Putterman C. Neuropsychiatric symptoms in lupus. *Psychiatr Ann.* 2012; **42**(9): 322–328.
7. Abd-Alrasool ZA, Gorial FI, Hashim MT. Prevalence and severity of depression among Iraqi patients with systemic lupus erythematosus: A descriptive study. *Mediterr J Rheumatol.* 2017; **28**(3):142–146.
8. Maneeton B, Maneeton N, Louthrenoo W. Prevalence and predictors of depression in patients with systemic lupus erythematosus: a cross-sectional study. *Neuropsychiatr Dis Treat.* 2013; **9**:799–804.
9. Moustafa AT, Moazzami M, Engel L, Bangert E, Hassanein M, Marzouk S, *et al*. Prevalence and metric of depression and anxiety in systemic lupus erythematosus: A systematic review and meta-analysis. *Semin Arthritis Rheum*. 2020; **50**(1):84–94.
10. Zhang L, Fu T, Yin R, Zhang Q, Shen B. Prevalence of depression and anxiety in systemic lupus erythematosus: a systematic review and meta-analysis. *BMC Psychiatry*. 2017; **17**(1):70.
11. Bachen EA, Chesney MA, Criswell LA. Prevalence of mood and anxiety disorders in women with systemic lupus erythematosus. *Arthritis Rheum*. 2009; **61**(6):822–829.
12. Huang X, Magder LS, Petri M. Predictors of incident depression in systemic lupus erythematosus. *J Rheumatol*. 2014; **41**(9):1823–33.
13. Hanly JG, Su L, Urowitz MB, Romero-Diaz J, Gordon C, Bae SC, *et al*. Mood disorders in systemic lupus erythematosus: results from an international inception cohort study. *Arthritis Rheumatol*. 2015; **67**(7):1837–47.
14. Nery FG, Borba EF, Hatch JP, Soares JC, Bonfá E, Neto FL. Major depressive disorder and disease activity in systemic lupus erythematosus. *Compr Psychiatry*. 2007; **48**(1):14–19.
15. Julian LJ, Tonner C, Yelin E, Yazdany J, Trupin L, Criswell LA, *et al.* Cardiovascular and disease related predictors of depression in SLE. *Arthritis Care Res* (Hoboken). 2011; **63**(4):542–549.
16. Mok CC, Chan KL, Cheung EFC, Yip PSF. Suicidal ideation in patients with systemic lupus erythematosus: incidence and risk factors. *Rheumatology* (Oxford). 2014; **53**(4):714–721.
17. Bai R, Liu S, Zhao Y, Cheng Y, Li S, Lai A, *et al*. Depressive and anxiety disorders in systemic lupus erythematosus patients without major neuropsychiatric manifestations. *J Immunol Res.* 2016; **2016**:2829018.
18. Yanih I. Quality of life in patient with systemic lupus erythematosus (SLE). *J Berkala Epidem.* 2016; **4**(1):1–12.
19. Levis B, Benedetti A, Thombs BD, Depression Screening Data (DEPRESSD) Collaboration. Accuracy of Patient Health Questionnaire-9 (PHQ-9) for screening to detect major depression: individual participant data meta-analysis. *Br Med J*. 2019; **365**:l1476.
20. Zuithoff NPA, Vergouwe Y, King M, Nazareth I, van Wezep MJ, Moons KGM, *et al*. The patient health questionnaire-9 for detection of major depressive disorder in primary care: consequences of current thresholds in a crosssectional study. *BMC Fam Pract*. 2010; **11**:98.
21. Mwangi P, Nyongesa MK, Koot HM, Cuijpers P, Newton CRJC, Abubakar A. Validation of a Swahili version of the 9-item Patient Health Questionnaire (PHQ-9) among adults living with HIV compared to a community sample from Kilifi, Kenya. *J Affect Disord Rep*. 2020; **1**:100013.
22. Jackson-Koku G. Beck depression inventory. *Occup Med.* 2016; **66**(2):174–175.
23. Garcia LC, Arija SM, Godoy-Navarrete F, Cabezas-Lucena AM, Diaz-Cordobes G, Mena- Vázquez N. Ab0865-Hpr Frequency of depression in systemic lupus erythematosus. *Annals Rheum Dis*. 2021; **80**(Suppl 1):1456–56.
24. Khedr EM, Gamal RM, Rashad SM, Yacoub M, Ahmed GK. Impact of depression on quality of life in systemic lupus erythematosus patients. *Egyptian J Neurol Psych Neurosurg.* 2021; **57**(1):88.
25. Yew YW, Kuan AHY, Ge L, Yap CW, Heng BH. Psychosocial impact of skin diseases: A population-based study. *PLoS One*. 2020; **15**(12):e0244765.
26. Al-Homood IA, Omran NE, Alwahibi AS, Aldosoghy M, Alharthy A, Aljohani GS. Depression in patients with systemic lupus erythematosus: A multicenter study. *Saudi J Med Med Sci.* 2017; **5**(3):248–253.
27. Karol DE, Criscione-Schreiber LG, Lin M, Clowse MEB. Depressive symptoms and associated factors in systemic lupus erythematosus. *Psychosomatics.* 2013; **54**(5):443–450.