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TO STUDY THE EFFECTIVENESS OF COGNITIVE BEHAVIORAL THERAPY (CBT) ON DEPRESSION IN PATIENTS OF SYSTEMIC LUPUS ERYTHEMATOSUS AT IGMC, SHIMLA

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Abstract: Introduction: Systemic lupus erythematosus (SLE) is an autoimmune disease, often with multisystemic involvement. Symptoms may manifest over a wide spectrum, with varying clinical presentations from mild mucocutaneous manifestations to multiorgan and severe central nervous system involvement. Of the various systems which can be affected by SLE, one of the more common yet relatively unexplored system is the central nervous system. NPSLE is one of the most complex and challenging manifestations of SLE, which involves the central nervous system (CNS), peripheral nervous system (PNS) and autonomous nervous system (ANS). The most common symptoms of NPSLE include mild cognitive dysfunction, mood disorders, anxiety, headaches, and psychosis. Aim: To study the effectiveness of Cognitive Behavioral Therapy (CBT) on neuropsychiatric manifestations in patients of SLE. Results: Depression as assessed by Hamilton Depression Rating Scale (HDRS) was 13.00 ± 2.49 in the treatment arm at the post intervention as compared to 16.50 ± 3.93 in the standard arm at the post intervention (p = 0.006). Patients receiving CBT showed improvement in HDRS scores as compared to control group. (From 17.90 ± 3.3 to 13 ± 2.5) Conclusion: CBT improves depressive symptoms as represented by HDRS scores. Thus, CBT or CBT-based interventions can be used with the pharmacological treatment of the SLE patients.

Index Terms **- CBT, Depression, NPSLE, HDRS**

I. INTRODUCTION

Systemic lupus erythematosus (SLE) is an autoimmune disease with a relapsing-remitting course.[1,2] NPSLE is one of the most complex and challenging manifestations of SLE, which involves the central nervous system (CNS), peripheral nervous system (PNS) and autonomous nervous system (ANS). The pathogenesis of Neuropsychiatric manifestations of SLE (NPSLE) is multifactorial. Two major pathways proposed for explaining the pathogenesis in NPSLE are an ischaemic pathway involving large and small blood vessels and second mechanism is an autoimmune-mediated neuroinflammatory pathway with complement activation which is associated with most diffuse neuropsychiatric manifestations such as psychosis, mood disorders, cognitive dysfunction and acute confusional states.[3-7] The utilization of CBT for managing and ameliorating psychiatric manifestations of NPSLE has been explored recently. Randomised controlled trials (RCTs) have found that CBT is associated with a significant reduction in the level of depression, anxiety and daily stress and a significant improvement in Quality of Life (QoL) and somatic symptoms throughout the entire follow-

up period.[8,9] Management protocols usually centre around long-term patient survival, maintaining an acceptable quality-of-life, and preventing relapses as much as possible.[2] The present study was done to assess the effectiveness of CBT on depression in patients of SLE.

II. RESEARCH METHODOLOGY

It was a single-blinded randomized clinical trial study conducted at Indira Gandhi Medical College and Hospital, Shimla. Patients of SLE, fulfilling 2019 EULAR/ACR (European League Against Rheumatism/ American College of Rheumatology) classification criterion for SLE and clinically stable for last 3 months attending Rheumatology Department from November 2020 to December 2021 were recruited into the study. A total of 40 patients were included after applying inclusion and exclusion criteria and they were divided into 2 groups (Control and CBT), each group containing 20 patients.

Inclusion criteria: Patients with age more than 18 years and up to 60 years and who give their consent to participate in the study.

Exclusion criteria: Subjects with acute confusional state, severe cognitive impairment, alcohol use disorder and other substance use disorders, chronic liver disease, chronic kidney disease, chronic viral infections like Hepatitis B, Hepatitis C, pregnancy, cerebrovascular accidents, coronary artery disease, malignancies and other intracranial disorders, persons who are unable to read and write in Hindi or English and suffering from severe psychiatric disorder.

III. RESULTS AND DISCUSSION

Results:

A total of 40 patients who fulfilled inclusion criteria were recruited in the study after obtaining the informed consent. They were divided into Control and CBT group, each group containing 20 patients. The median HDRS value in 40 patients was 17.0 (15.0, 19.0). There was no statistically significant difference between the median values of HDRS total score in CBT group at 17.5 (15.0, 21.2) and that of control group at 16.5 (14.0, 18.0) (p=0.2) at baseline. After intervention with CBT, the median HDRS value in 40 patients was 14.0 (12.0, 17.0). There was statistically significant difference between the median values of HDRS total score in CBT group at 13.0 (11.8, 14.2) and that of control group at 16.5 (13.0, 20.0) (p=0.006).

Table 1: HDRS scoring at baseline Characteristic	N = 40[1]
HDRS-Depression mood-baseline	
1	3.00 (7.50%)
2	34.00 (85.00%)
3	3.00 (7.50%)
HDRS-Feeling of guilt-baseline	
0	4.00 (10.00%)
1	17.00 (42.50%)
2	16.00 (40.00%)
3	3.00 (7.50%)
HDRS-Suicide-baseline	
0	39.00 (97.50%)
2	1.00 (2.50%)
HDRS-Insomnia-early night-baseline	
0	5.00 (12.50%)
1	29.00 (72.50%)
2	6.00 (15.00%)
HDRS-Insomnia-middle night-baseline	
0	4.00 (10.00%)
1	31.00 (77.50%)
2	5.00 (12.50%)
HDRS-Insomnia-early morning-baseline	
0	4.00 (10.00%)
1	27.00 (67.50%)
2	9.00 (22.50%)
HDRS-Work and activities-baseline	
0	7.00 (17.50%)
1	13.00 (32.50%)
2	16.00 (40.00%)
3	4.00 (10.00%)
HDRS-Retardation-baseline	
0	8.00 (20.00%)
1	21.00 (52.50%)
2	9.00 (22.50%)
3	2.00 (5.00%)
HDRS-Agitation-baseline	
0	29.00 (72.50%)
1	6.00 (15.00%)
2	3.00 (7.50%)
3	2.00 (5.00%)
HDRS-Anxiety-psychic-baseline	
0	2.00 (5.00%)
1	5.00 (12.50%)
2	24.00 (60.00%)
3	9.00 (22.50%)
HDRS-Anxiety-somatic-baseline	
0	4.00 (10.00%)
1	9.00 (22.50%)
2	24.00 (60.00%)
3	3.00 (7.50%)
HDRS-Somatic symptoms GI-baseline	
0	9.00 (22.50%)
1	22.00 (55.00%)

2	9.00 (22.50%)
HDRS-Somatic symptoms general-baseline	
0	10.00 (25.00%)
1	23.00 (57.50%)
2	7.00 (17.50%)
HDRS-Genital symptoms-baseline	
0	33.00 (82.50%)
1	5.00 (12.50%)
2	2.00 (5.00%)
HDRS-Hypochondriasis-baseline	
0	25.00 (62.50%)
1	11.00 (27.50%)
2	3.00 (7.50%)
3	1.00 (2.50%)
HDRS-Weight loss-baseline	
0	16.00 (40.00%)
1	13.00 (32.50%)
2	11.00 (27.50%)
HDRS-Insight-baseline	8.00 (20.00%)
HDRS-Total-Baseline	
Median, (IQR))	17.0, (15.0, 19.0))
Range	10.0, 24.0
Mean (SD)	17.1 (3.5)
[1]n (%)	

Table 2: HDRS scoring at baseline in groups

Characteristic	CBT, N = 20[1]	CONTROL, N = 20[1]	p-value[2]
HDRS-Depression mood-baseline			0.2
1	2.00 (10.00%)	1.00 (5.00%)	
2	15.00 (75.00%)	19.00 (95.00%)	
3	3.00 (15.00%)	0.00 (0.00%)	
HDRS-Feeling of guilt-baseline			0.14
0	4.00 (20.00%)	0.00 (0.00%)	
1	8.00 (40.00%)	9.00 (45.00%)	
2	6.00 (30.00%)	10.00 (50.00%)	
3	2.00 (10.00%)	1.00 (5.00%)	
HDRS-Suicide-baseline			>0.9
0	19.00 (95.00%)	20.00 (100.00%)	
2	1.00 (5.00%)	0.00 (0.00%)	
HDRS-Insomnia-early night-baseline			0.2
0	3.00 (15.00%)	2.00 (10.00%)	
1	12.00 (60.00%)	17.00 (85.00%)	
2	5.00 (25.00%)	1.00 (5.00%)	
HDRS-Insomnia-middle night-baseline			0.057
0	2.00 (10.00%)	2.00 (10.00%)	
1	13.00 (65.00%)	18.00 (90.00%)	
2	5.00 (25.00%)	0.00 (0.00%)	
HDRS-Insomnia-early morning-baseline			0.3
0	3.00 (15.00%)	1.00 (5.00%)	
1	11.00 (55.00%)	16.00 (80.00%)	
2	6.00 (30.00%)	3.00 (15.00%)	
HDRS-Work and activities-baseline			<0.001
0	7.00 (35.00%)	0.00 (0.00%)	
1	5.00 (25.00%)	8.00 (40.00%)	
2	4.00 (20.00%)	12.00 (60.00%)	
3	4.00 (20.00%)	0.00 (0.00%)	
HDRS-Retardation-baseline			0.027

0	6.00 (30.00%)	2.00 (10.00%)	
1	6.00 (30.00%)	15.00 (75.00%)	
2	6.00 (30.00%)	3.00 (15.00%)	
3	2.00 (10.00%)	0.00 (0.00%)	
HDRS-Agitation-baseline			0.007
0	10.00 (50.00%)	19.00 (95.00%)	
1	5.00 (25.00%)	1.00 (5.00%)	
2	3.00 (15.00%)	0.00 (0.00%)	
3	2.00 (10.00%)	0.00 (0.00%)	
HDRS-Anxiety-psychic-baseline			0.043
0	1.00 (5.00%)	1.00 (5.00%)	
1	2.00 (10.00%)	3.00 (15.00%)	
2	9.00 (45.00%)	15.00 (75.00%)	
3	8.00 (40.00%)	1.00 (5.00%)	
HDRS-Anxiety-somatic-baseline			0.15
0	3.00 (15.00%)	1.00 (5.00%)	
1	5.00 (25.00%)	4.00 (20.00%)	
2	9.00 (45.00%)	15.00 (75.00%)	
3	3.00 (15.00%)	0.00 (0.00%)	
HDRS-Somatic symptoms GI-baseline			0.11
0	7.00 (35.00%)	2.00 (10.00%)	
1	8.00 (40.00%)	14.00 (70.00%)	
2	5.00 (25.00%)	4.00 (20.00%)	
HDRS-Somatic symptoms general-baseline			0.6
0	5.00 (25.00%)	5.00 (25.00%)	
1	10.00 (50.00%)	13.00 (65.00%)	
2	5.00 (25.00%)	2.00 (10.00%)	
HDRS-Genital symptoms-baseline			0.5
0	15.00 (75.00%)	18.00 (90.00%)	
1	4.00 (20.00%)	1.00 (5.00%)	
2	1.00 (5.00%)	1.00 (5.00%)	
HDRS-Hypochondriasis-baseline			0.071

0	13.00 (65.00%)	12.00 (60.00%)	
1	3.00 (15.00%)	8.00 (40.00%)	
2	3.00 (15.00%)	0.00 (0.00%)	
3	1.00 (5.00%)	0.00 (0.00%)	
HDRS-Weight loss-baseline			0.2
0	7.00 (35.00%)	9.00 (45.00%)	
1	9.00 (45.00%)	4.00 (20.00%)	
2	4.00 (20.00%)	7.00 (35.00%)	
HDRS-Insight-baseline	6.00 (30.00%)	2.00 (10.00%)	0.2
HDRS-Total-Baseline			0.2
Median, (IQR))	17.5, (15.0, 21.2))	16.5, (14.0, 18.0))	
Range	12.0, 23.0	10.0, 24.0	
Mean (SD)	17.9 (3.3)	16.3 (3.6)	
[1]n (%)			
[2]Fisher's exact test; Pearson's Chi-squared test; Wilcoxon rank sum test			

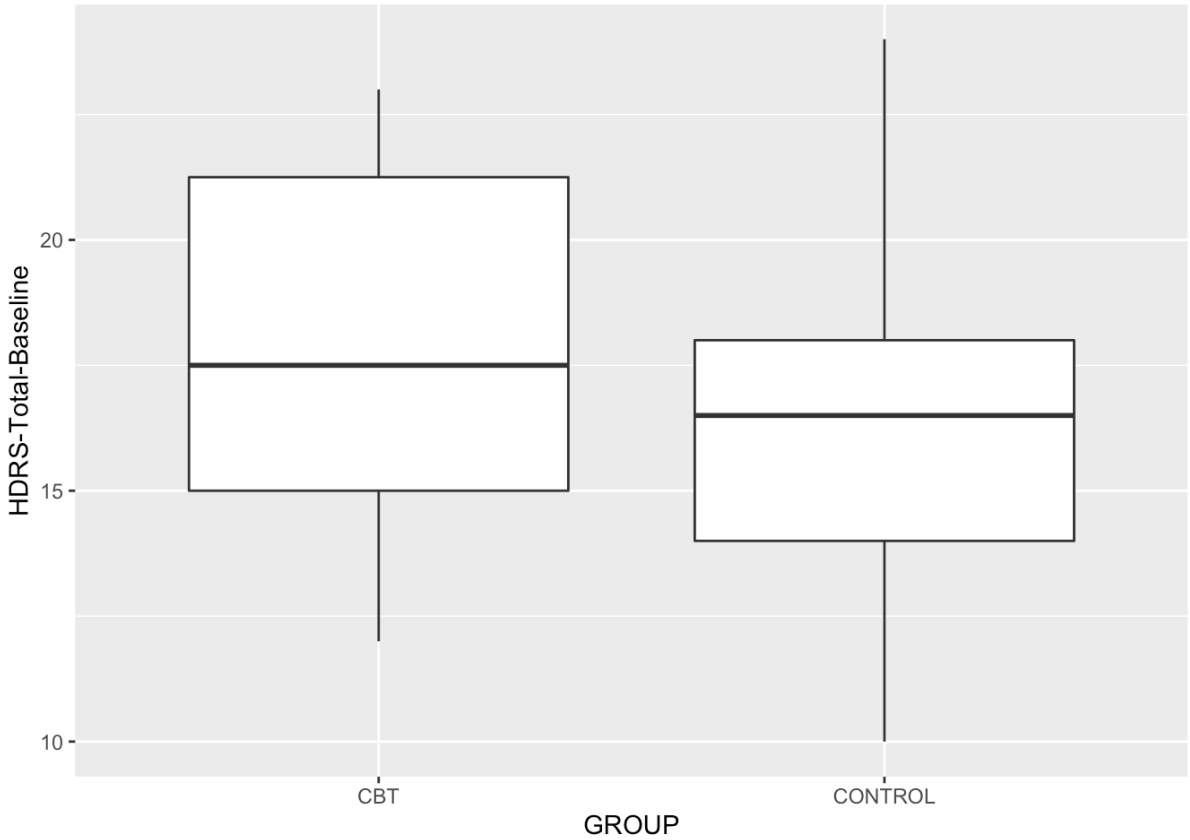

Figure 1: The median HDRS value in 40 patients was 17.0 (15.0, 19.0). There was no statistically significant difference between the median values of HDRS total score in CBT group at 17.5 (15.0, 21.2) and that of control group at 16.5 (14.0, 18.0) (p=0.2).

Table 3: Post intervention HDRS

Characteristic	N = 40[1]
HDRS-Depressed mood	
0	6.00 (15.00%)
1	19.00 (47.50%)
2	11.00 (27.50%)
3	4.00 (10.00%)
HDRS-Feelings of guilt	
0	8.00 (20.00%)
1	16.00 (40.00%)
2	12.00 (30.00%)
3	4.00 (10.00%)
HDRS-Suicide	1.00 (2.50%)
HDRS-Insomnia-early night	
0	14.00 (35.00%)
1	22.00 (55.00%)
2	4.00 (10.00%)
HDRS-Insomnia-middle night	19.00 (47.50%)
HDRS-Insomnia-early morning	
0	25.00 (62.50%)
1	14.00 (35.00%)
2	1.00 (2.50%)
HDRS-Work and activities	
0	7.00 (17.50%)
1	14.00 (35.00%)
2	10.00 (25.00%)
3	9.00 (22.50%)
HDRS-Retardation	
0	9.00 (22.50%)
1	13.00 (32.50%)
2	10.00 (25.00%)
3	8.00 (20.00%)
HDRS-Agitation	

0	31.00 (77.50%)
1	5.00 (12.50%)
2	4.00 (10.00%)
HDRS-Anxiety-psychic	
0	7.00 (17.50%)
1	11.00 (27.50%)
2	16.00 (40.00%)
3	6.00 (15.00%)
HDRS-Anxiety-somatic	
0	10.00 (25.00%)
1	14.00 (35.00%)
2	14.00 (35.00%)
3	2.00 (5.00%)
HDRS-Somatic symptoms GI	
0	15.00 (37.50%)
1	21.00 (52.50%)
2	4.00 (10.00%)
HDRS-Somatic symptoms general	
0	22.00 (55.00%)
1	11.00 (27.50%)
2	7.00 (17.50%)
HDRS-Genital symptoms	
0	21.00 (52.50%)
1	15.00 (37.50%)
2	4.00 (10.00%)
HDRS-Hypochondriasis	
0	14.00 (35.00%)
1	10.00 (25.00%)
2	12.00 (30.00%)
3	4.00 (10.00%)
HDRS-Weight loss	
0	13.00 (32.50%)

1	15.00 (37.50%)
2	12.00 (30.00%)
HDRS-Insight	15.00 (37.50%)
HDRS-Total- post intervention	
Median, (IQR))	14.0, (12.0, 17.0))
Range	7.0, 23.0
Mean (SD)	14.8 (3.7)
[1]n (%)	

Table 4: Post intervention HDRS in group

Characteristic	CBT, N = 20[1]	CONTROL, N = 20[1]	p-value[2]
HDRS-Depression mood			0.014
0	5.00 (25.00%)	1.00 (5.00%)	
1	7.00 (35.00%)	12.00 (60.00%)	
2	8.00 (40.00%)	3.00 (15.00%)	
3	0.00 (0.00%)	4.00 (20.00%)	
HDRS-Depression guilt			0.2
0	4.00 (20.00%)	4.00 (20.00%)	
1	8.00 (40.00%)	8.00 (40.00%)	
2	8.00 (40.00%)	4.00 (20.00%)	
3	0.00 (0.00%)	4.00 (20.00%)	
HDRS-Suicide	1.00 (5.00%)	0.00 (0.00%)	>0.9
HDRS-Insomnia-early night			0.6
0	8.00 (40.00%)	6.00 (30.00%)	
1	11.00 (55.00%)	11.00 (55.00%)	
2	1.00 (5.00%)	3.00 (15.00%)	
HDRS-Insomnia-middle night	6.00 (30.00%)	13.00 (65.00%)	0.027
HDRS-Insomnia-early morning			<0.001
0	19.00 (95.00%)	6.00 (30.00%)	
1	0.00 (0.00%)	14.00 (70.00%)	
2	1.00 (5.00%)	0.00 (0.00%)	
HDRS-Work and activities			0.6
0	3.00 (15.00%)	4.00 (20.00%)	

1	9.00 (45.00%)	5.00 (25.00%)	
2	4.00 (20.00%)	6.00 (30.00%)	
3	4.00 (20.00%)	5.00 (25.00%)	
HDRS-Retardation			0.2
0	6.00 (30.00%)	3.00 (15.00%)	
1	5.00 (25.00%)	8.00 (40.00%)	
2	7.00 (35.00%)	3.00 (15.00%)	
3	2.00 (10.00%)	6.00 (30.00%)	
HDRS-Agitation			0.7
0	15.00 (75.00%)	16.00 (80.00%)	
1	2.00 (10.00%)	3.00 (15.00%)	
2	3.00 (15.00%)	1.00 (5.00%)	
HDRS-Anxiety-psychic			0.080
0	5.00 (25.00%)	2.00 (10.00%)	
1	7.00 (35.00%)	4.00 (20.00%)	
2	4.00 (20.00%)	12.00 (60.00%)	
3	4.00 (20.00%)	2.00 (10.00%)	
HDRS-Anxiety-somatic			0.2
0	3.00 (15.00%)	7.00 (35.00%)	
1	8.00 (40.00%)	6.00 (30.00%)	
2	9.00 (45.00%)	5.00 (25.00%)	
3	0.00 (0.00%)	2.00 (10.00%)	
HDRS-Somatic symptoms GI			<0.001
0	13.00 (65.00%)	2.00 (10.00%)	
1	6.00 (30.00%)	15.00 (75.00%)	
2	1.00 (5.00%)	3.00 (15.00%)	
HDRS-Somatic symptoms general			<0.001
0	17.00 (85.00%)	5.00 (25.00%)	
1	0.00 (0.00%)	11.00 (55.00%)	
2	3.00 (15.00%)	4.00 (20.00%)	
HDRS-Genital symptoms			0.8
0	10.00 (50.00%)	11.00 (55.00%)	

1	7.00 (35.00%)	8.00 (40.00%)	
2	3.00 (15.00%)	1.00 (5.00%)	
HDRS-Hypochondriasis			0.050
0	9.00 (45.00%)	5.00 (25.00%)	
1	3.00 (15.00%)	7.00 (35.00%)	
2	8.00 (40.00%)	4.00 (20.00%)	
3	0.00 (0.00%)	4.00 (20.00%)	
HDRS-Weight loss			0.4
0	5.00 (25.00%)	8.00 (40.00%)	
1	7.00 (35.00%)	8.00 (40.00%)	
2	8.00 (40.00%)	4.00 (20.00%)	
HDRS-Insight	7.00 (35.00%)	8.00 (40.00%)	0.7
HDRS-Total-post intervention			0.006
Median, (IQR))	13.0, (11.8, 14.2))	16.5, (13.0, 20.0))	
Range	7.0, 17.0	10.0, 23.0	
Mean (SD)	13.0 (2.5)	16.5 (3.9)	
[1]n (%)			
[2]Fisher's exact test; Pearson's Chi-squared test; Wilcoxon rank sum test			

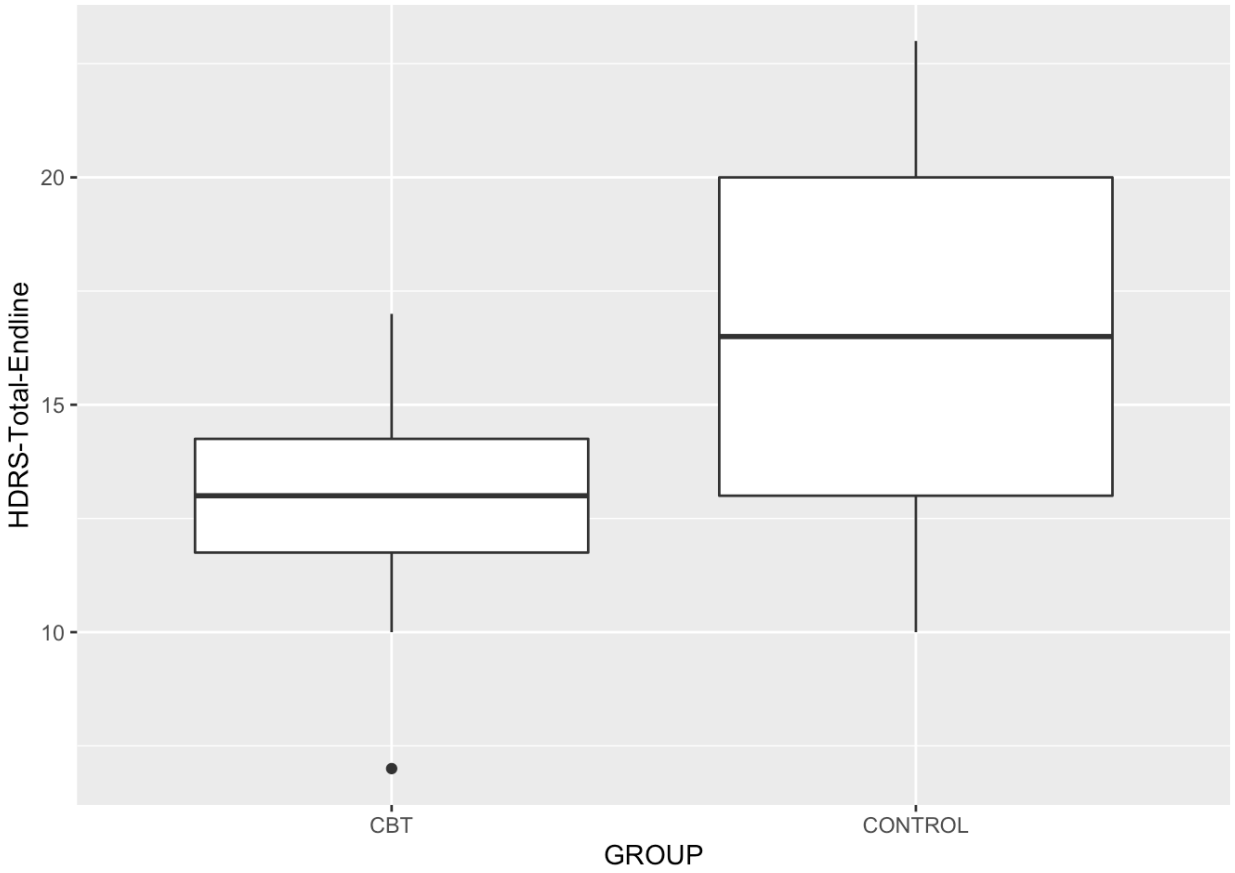

Figure 2: The median HDRS value in 40 patients was 14.0 (12.0, 17.0). There was statistically significant difference between the median values of HDRS total score in CBT group at 13.0 (11.8, 14.2) and that of control group at 16.5 (13.0, 20.0) (p=0.006).

Discussion:

The present study was a single-blinded randomized clinical study conducted in the Department of Psychiatry at Indira Gandhi Medical College and Hospital, Shimla. Effect of CBT on depression in patients of SLE was assessed. Pre- and post-intervention assessment of HDRS scores was conducted on both the groups and compared to understand the improvement of depression due to CBT intervention in SLE patients.

Depression is highly prevalent in SLE patients. In the index study, depression as assessed by HDRS was 13.00 ± 2.49 in the treatment arm at the post intervention as compared to 16.50 ± 3.93 in the standard arm at the post intervention ($p = 0.006$) and mean difference between the groups in HDRS score from baseline was also found to be statistically significant ($p < 0.001$). In our study, we also found that the scores in the CBT group improved from 17.9 ± 3.3 at baseline to 13.00 ± 2.5 post-intervention group. Our findings are in line with findings to that seen by Sakr et al[10] (2022), Navarrete – Navarrete N et al[8] demonstrated an improvement in the depression scores in the treatment groups as compared to standard care groups at baseline and post-

intervention. They found that scores improved from 13.6 ± 4.1 (pre-intervention) to 8.9 ± 2.3 (post-intervention) in the treatment group as compared to an increase from 12.7 ± 2.5 at baseline to 14.4 ± 2.8 post-intervention in the control group.

CBT has shown to improve patients' mental health. HDRS scores showed significant improvement in depressive symptoms with CBT. Thus, it can be said that CBT or CBT-based interventions can be used with the pharmacological treatment of the SLE patients.

1V. ACKNOWLEDGMENT

I take great pleasure in expressing my profound gratitude and heartfelt thanks to all those who have helped me in the successful accomplishment of this study. I am highly indebted to my colleagues whose endless support helped me throughout my study. My whole hearted thanks to my patients for their patience and help in my study.

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