

# Revealing the Beauty of Cestrum Nocturnum Flower (CNF) Extract: Discovering the Promising Potential of CNF Extract in Safeguarding and Managing Depression - A Randomized, Double-blind, Placebo-Controlled Clinical Trial

Maaz Ahmad<sup>1</sup>, Mudassar Ali<sup>2</sup>, Syma Arshad<sup>3</sup>, Fizza Anwar<sup>4</sup>, Asma Kanwal<sup>5</sup>, Hamna Ahmad<sup>6</sup>, Mussab Ahmad<sup>7</sup>, Daniyal Safdar<sup>8</sup>

- 1 Professor, Department of Community Medicine, Rashid Latif Medical College, Lahore, Pakistan  
*Conception & Design, final approval & Guarantor of the article*
- 2 Professor, Department of Physiology, Rashid Latif Medical College, Lahore, Pakistan  
*Statistical expertise, Important intellectual content*
- 3 Associate Professor, Department of Community Medicine, Rashid Latif Medical College, Lahore, Pakistan  
*Collection & assembly of data and Important intellectual content*
- 4 Assistant Professor, Department of Community Medicine, Rashid Latif Medical College, Lahore, Pakistan  
*Assembly of data and Important intellectual content, data Acquisition*
- 5 Assistant Professor, Department of Community Medicine, Rashid Latif Medical College, Lahore, Pakistan  
*Statistical expertise, Important intellectual content*
- 6 Assistant Professor, Department of Nutrition, University of Lahore, Lahore, Pakistan  
*Collection & assembly of data and Important intellectual content*
- 7 Assistant Professor, Department of Pediatrics, King Edward Medical University, Lahore Pakistan  
*Assembly of data and Important intellectual content*
- 8 Lecturer, Biostatistics, Rashid Latif Medical College, Lahore Pakistan  
*Design analysis, Interpretation of the Data*

## CORRESPONDING AUTHOR

**Dr. Maaz Ahmad**  
Professor, Department of Community Medicine,  
Rashid Latif Medical College, Lahore Pakistan  
Email: profmaaz@gmail.com

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## ABSTRACT

**Background:** Depression (major depressive disorder) is a common and serious medical illness that negatively affects how you feel, the way you think and how you act. Fortunately, it is also manageable. Depression causes feelings of sadness and/or a loss of interest in activities you once enjoyed. **Objective:** The purpose of this study was to evaluate efficacy of Cestrum nocturnum Flower (CNF) extract for prevention and control of depression. **Study Design:** A pragmatic, randomized, double-blind, placebo-controlled clinical trial. **Settings:** Lahore urban community. **Duration:** March 23,2023 to June 28,2023. **Methods:** In the study conducted, sixty depressed patients were recruited and randomized to either the Group A (CNF extract) or Group B (placebo group) at a 1:1 ratio. The subjects received CNF extract or placebo for four weeks. The major outcome was relief in depression. **Results:** At base line there was no difference between CNF and placebo group regarding depression. All the CNF group patients took the CNF extract for four weeks. Similarly, placebo group was given placebo for the same period. There was a significant difference between these two groups as far as depression was concerned up to the end of 4 weeks trial with P value <0.05. **Conclusion:** CNF extract had a significant effect on depression prevention and control.

**Keywords:** Depression, Cestrum Nocturnum Flower (CNF) extract, Randomized, Placebo, Double blind.

## INTRODUCTION

Depression (major depressive disorder) is a common and serious medical illness that negatively affects how you feel, the way you think and how you act. Depression is characterized by continuous low mood or sadness, feeling hopeless and helpless. Having low self-esteem. There are two most commonly observed types of depression i.e. Major and persistent. In major depressive

disorder a patient may feel depressed most of the time for most days of the week along with other possible symptoms like loss of interest or pleasure in your activities, insomnia, feeling restless, guilty or worthless.<sup>1</sup> A person suffering from persistent depressive disorder may experience lack of appetite or increased urge for over eating, lacking sleep or sleepier, very much debilitated, fatigued, low self-esteem, trouble concentrating or making decisions and feeling hopeless. Bipolar disorder

or manic depression comprise of extreme mood changes. Seasonal Affective Disorder (SAD) often happens during the winter due to short days without sunlight.<sup>2</sup> Population living in Africa, and Asia has the highest prevalence of depression and more females are affected.<sup>3</sup> Depression is found more in developing countries most probably due to poor psychological health.<sup>4</sup> Depression is a debilitating mood disorder with a worldwide prevalence estimated at 4.4%.<sup>5</sup> Depression is quite prevalent in Pakistan ranging from 22% to 60%.<sup>6</sup> Postpartum depression was found in 67.96 % of the participating women and Edinburg postnatal depression scale (EPDS) was found to be the most reliable tool to evaluate postpartum depression.<sup>7</sup> In a self-reporting study conducted during COVID-19 in Pakistan Hospital Anxiety and Depression Scale (HADS). Out of the total sample population (N=354), 39.9% suffered from depression and 57.7% from anxiety.<sup>8</sup> Results of a cross-sectional study conducted in Karachi, Low socioeconomic status, poor physical conditions, chronic diseases, emotional traumas and family traditions are responsible for the disease.<sup>9</sup> A cross-sectional survey was conducted using an online questionnaire sent to volunteer participants during COVID-19 lockdown. Out of the total sample population 39% suffered from depression.<sup>10</sup>

Several different factors can increase the risk of experiencing depression. Sudden changes in weather or environment, issues related to sexuality and body image, marital conflicts such as divorce, extramarital affairs, or incompatibility, disruptions in sleep patterns, either too much or too little sleep, feeling controlled by parents, spouse, or in-laws, lifestyle changes due to work, marriage, or migration, emotional stress, overexertion, loud or sudden noises, lack of social support, motion sickness, miscarriage, or infertility, feeling overwhelmed with responsibilities or being a single parent, trauma resulting from physical or mental abuse, menopause, co-occurring bipolar disorder and sleep disorders.<sup>11</sup>

Unaddressed melancholy can lead to a range of emotional, behavioral, and health issues that permeate all aspects of your teenager's existence. Some potential complications associated with teenage depression include attempts or contemplation of suicide, academic struggles, misuse of alcohol and drugs. In a study, the most predictive factors of suicide attempts were history of untreated depression.<sup>12</sup> Clinically depression is treated by various types of synthetic medicines such as tricyclic antidepressants, selective dopamine reuptake inhibitors, SSRIs etc. But cost of treatment, poor response rate and undesirable side effects are the barriers in prolonged treatment.<sup>13</sup> Many plants have been found effective in combating with the agonies of depression.<sup>14</sup> *Cestrum nocturnum* Linn. is one of the most important garden shrub, also known with many other names as Lady of the

Night, Queen of the Night, and Night-blooming Jasmine, Studies revealed anti-oxidant and anti-cancer property in its flowers extract.<sup>15</sup> Its anti-oxidant property has been documented in many studies.<sup>16</sup> Some evidence suggest that only about half of the people taking antidepressants achieve a clinically significant response.<sup>17</sup> Due to side effects and contra-indications there is dire need to develop a remedy which is free of all these drawbacks. So there is dire need to develop a remedy which is free of all these drawbacks. Present study was designed to explore the herbal extract for remedial measure for depression.

## METHODS

It was randomized controlled trial conducted in Lahore urban community in 3 months from March 23,2023 to June 28,2023. Study protocol was approved by the Institutional Review Board of Rashid Latif Medical College Lahore. (Ref# IRB/2023/104). An urban community located within Lahore was randomly selected as the target population. The community was chosen using a multistage sampling technique, which involved multiple stages of random selection. This ensured that individuals from the community were selected in a random and representative manner for the study.

The sample size was determined based on an expected prevalence rate of 14% at the global level. With 80% power, at 95% confidence interval, and a 10% allowable error, by using the formula  $(Z)^2 * p(1-p) / e^2$  the sample size of 33 participants per group was deemed sufficient.

A total of 66 patients with depression between the ages of 18 and 65 were selected using consecutive sampling. The selection was based on Hamilton depression scale. Only patients who were non-willing, using medications affecting depression e.g., tricyclic antidepressant, monoamine oxidase inhibitor, corticosteroid, botulinum toxin) Informed consent was taken before commencement of the trial. Eligible participants were randomly assigned to either the Group A (CNF extract) or Group B (placebo group) in a 1:1 ratio for a period of four weeks.

To obtain extract from the *Cestrum nocturnum* Flowers (CNF), the flowers were dried in a shaded area and finely ground into a powder. This powder was placed in the thimble of Soxhlet apparatus. By subjecting it to a temperature of 60 degrees Celsius, an ethanolic extract was obtained. The ethanol in the extract was then removed through evaporation under vacuum using a rotary evaporator, resulting in the production of a crude extract. Next, the resulting extract was diluted until it reached a concentration of 1 ppm. This diluted solution, which was obtained from the extraction process, was used as the experimental therapy for a group referred to as the CNF group. In the CNF (treatment) group A,

patients received a dosage of 5 ppm CNF extract diluted in 250 ml of water, three times a day for a duration of one week. On the other hand, the placebo group (B) received plain water with a similar appearance as the CNF extract. The effectiveness of this experimental therapy was then compared to that of placebo group. The hypothesis proposed was that the extract obtained from the *Cestrum nocturnum* Flower (CNF) could potentially be effective in preventing and managing depression. To evaluate the effectiveness of the CNF extract for the prevention and treatment of depression, a carefully designed study was conducted. This study aimed to assess the real-world effectiveness of the CNF extract while ensuring both the researchers and the participants unaware of who received the CNF extract and who received a placebo.

The trial was conducted in accordance with the principles outlined in the Declaration of Helsinki, which provides ethical guidelines for medical research involving human subjects. The primary outcome measured in the study was the relief in depression. Hamilton depression scale was used to measure the level of depression. SPSS version 25 software was used to analyze the data in this study and Chi-squared test was used for between group analyses.

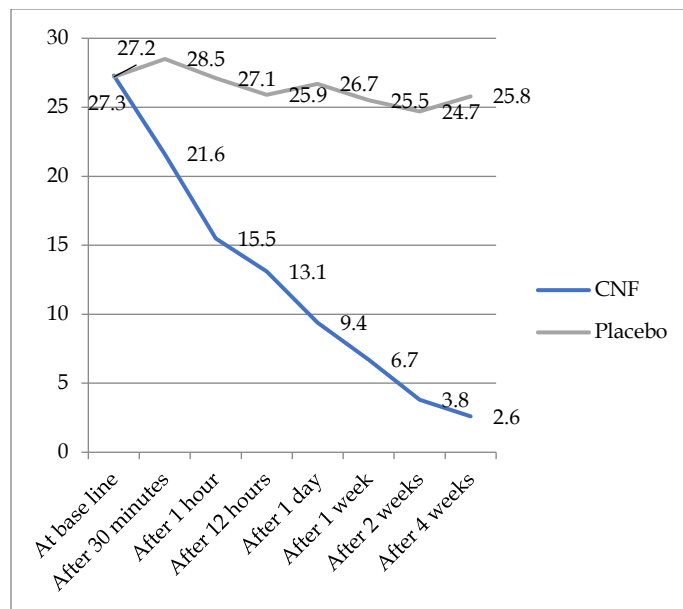
**RESULTS**

Sixty-six patients were screened for eligibility criteria for entrance into study. These patients were divided into 2 groups i.e., CNF extract and Placebo group comprising of 33 depression patients each. No significant differences between these two groups was observed in the baseline data evaluated on Hamilton Depression Rating Scale. Measurements were taken after half an hour, one hour, 12 hours, 24 hours, 1 week, 2 weeks and 4 weeks. Significant difference was found between these two groups in these measurement. So, it is concluded that CNF extract significantly improved depression level as compared with placebo group. (Table 1 and Figure 1)

**Table 1: Comparison of CNF extract with Placebo regarding management of Depression Group**

Evaluation	Group A (CNF)	Group B (Placebo)	p-Value
At Base line	27.3	27.2	0.639
After 30 minutes	21.6	28.5	<0.001*
After one hour	15.5	27.1	<0.001*
After 12 hours	13.1	25.9	<0.001*
After 24 hours	09.4	27.4	<0.001*
After one week	06.7	21.5	<0.001*
After two weeks	03.8	24.7	<0.001*
After four weeks	02.6	25.8	<0.001*

**Figure 1: Comparison of CNF extract with Placebo regarding management of Depression**



**DISCUSSION**

Present study demonstrated significant efficacy of CNF extract in depression management, it is estimated that herbal medicine is utilized by as many as 80% of the global population.<sup>18</sup> Literature showed a variety of herbal mechanisms of action used for the therapy of depression. St. John's wort is one herb commonly used to treat mild to moderate depression but it is not without side effects. Common side effects associated with St. John's wort are usually mild and may include skin rashes, tiredness and dizziness. St. John's wort can lead to a condition called photo dermatitis.<sup>19</sup> If you have been diagnosed with bipolar disorder, it is important to avoid taking St. John's wort. St. John's wort can potentially affect mood and may trigger manic or hypomanic episodes in individuals with bipolar disorder.<sup>20</sup> St. John's wort is contraindicated in pregnancy The Food and Drug Administration (FDA) advises against using St. John's wort in conjunction with any antiretroviral medication employed for HIV or AIDS treatment.<sup>21</sup>

In a study consumption of lavender herbal tea was found to reduce depression.<sup>22</sup> Ginseng, a herb that has been widely utilized in traditional Chinese medicine for centuries to enhance mood and promote overall health. However, its usage may lead to certain side effects, including headaches, changes in blood pressure, diarrhea, skin irritations, and vaginal bleeding. There have also been reports of ginseng-associated episodes of mania. It is important to note that ginseng directly enhances the elimination of warfarin from the body. As a result, combining ginseng with warfarin is not recommended and is considered a contraindication, black

cohosh may be hepatotoxic and mild gastro-intestinal upset Chamomile may produce mild gastric irritation, chasteberry, Lavender, Ginkgo biloba have mild adverse effects including headache, heart palpitations, gastro-intestinal upset, constipation, allergic skin reactions

Saffron and passionflower were found effective in depression and anxiety. In one study withania somnifera worked as effective antidepressants.

## CONCLUSION

The extract from the *Cestrum nocturnum* Flower (CNF) is considered as effective natural remedy for managing depression. It provides quick relief in reducing intensity of signs and symptoms depressive patients, in a remarkably short amount of time. Additionally, CNF extract has no known side effects and does not pose any contraindications.

## LIMITATIONS

Larger studies are required to explore other beneficial effects of extract from the *Cestrum nocturnum* Flower (CNF).

## SUGGESTIONS / RECOMMENDATIONS

This is the time to focus plant medications which are more effective, locally prepared and much more economical in our present environment.

## CONFLICT OF INTEREST / DISCLOSURE

None to declare.

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