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**Manjula S**
Senior Vice President, Department of Medical Services, Micro Labs Limited, Bangalore, Karnataka, India

**Krishna Kumar M**
Department of Medical Services, Micro Labs Limited, Bangalore, Karnataka, India

**Corresponding Author:**
**Manjula S**
Senior Vice President, Department of Medical Services, Micro Labs Limited, Bangalore, Karnataka, India

# Expert opinion on psychopharmacological treatments for neuropsychiatric disorders in Indian settings

**Manjula S and Krishna Kumar M**

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**Abstract**
**Objective:** To gather clinicians' perspectives on the use of psychopharmacological treatments for managing neuropsychiatric disorders, with a particular focus on medications such as citicoline, piracetam, selective serotonin reuptake inhibitors (SSRIs), benzodiazepines, and divalproex sodium in Indian clinical settings.
**Methodology:** This cross-sectional study was conducted among clinical experts across India and gathered feedback on clinical use, prescription practices, and experiences with psychopharmacological treatments for various neuropsychiatric disorders, emphasizing medications like citicoline, piracetam, SSRIs, benzodiazepines, and divalproex sodium. Participants independently completed a 23-item questionnaire after providing informed consent. Descriptive statistics were applied to analyze the data, with categorical variables expressed as percentages and visualized using pie and bar charts.
**Result:** Of the 174 study participants, 71.84% preferred citicoline and piracetam for the treatment of post-stroke aphasia. Approximately 59% of clinicians identified cardiovascular disease and endocrine dysfunction as common comorbidities in patients with depression. Most respondents (75.86%) selected SSRIs as the first-line antidepressant, and around 65% recommended combining cognitive behavioral therapy (CBT) with medication for depression management. A significant majority (82%) of clinicians chose divalproex sodium for managing rapid cycling episodes of bipolar disorder (BD). For generalized anxiety disorder (GAD), 71% of participants favored a combination of SSRIs and benzodiazepines, with 67% recommending SSRIs for daytime anxiety relief. Additionally, nearly 82% of participants supported the use of both pharmacotherapy and psychotherapy for treating post-traumatic stress disorder (PTSD).
**Conclusion:** This study provides insights into current pharmacological practices for various neuropsychiatric disorders, including post-stroke aphasia, depression, BD, GAD, and PTSD. Citicoline and piracetam are widely preferred for aphasia, SSRIs for depression, and divalproex sodium for BD. Combination therapies, including SSRIs, benzodiazepines, and psychotherapy, are emphasized for achieving optimal treatment outcomes.

**Keywords:** Neuropsychiatric disorders, aphasia, depression, citicoline, SSRIs, PTSD

## Introduction

Neuropsychiatric disorders account for over 10% of the global disability burden, exceeding cardiovascular diseases and cancer [1]. In 2021, more than 3 billion individuals had neurological conditions. Among stroke survivors, nearly one-third develop aphasia, with 21%-38% experiencing persistent impairment [2, 3]. The global incidence of aphasia is 43 per 100,000 per year, with a prevalence of 3,000 per million. Mental health conditions affect 450-500 million individuals worldwide, with anxiety and depression being the most common. The COVID-19 pandemic further increased their prevalence [4]. Bipolar Affective Disorder (BPAD) has a global prevalence of 0.7%, affecting 0.6% of males and 0.8% of females [5].

In India, approximately 197.3 million individuals are affected by mental disorders, including 45.7 million with depressive disorders and 44.9 million with anxiety disorders [6]. Around two million people in India are living with aphasia. The prevalence of BPAD in the country is 0.6% for both genders, with a global male-to-female prevalence ratio of 0.8 (0.5-1.1) [5]. Additionally, an estimated 3.9% of the global population has experienced post-traumatic stress disorder (PTSD) at some point in their lives, with a PTSD prevalence of 0.24% in the Indian general population [7, 8].

Several pharmaceutical agents improve outcomes in neuropsychiatric conditions through distinct yet complementary mechanisms. Citicoline supports neuronal membrane repair and regeneration by providing choline and cytidine for phosphatidylcholine synthesis and acetylcholine production, while also reducing free fatty acid-induced toxicity during ischemic insult [9]. Piracetam enhances neurotransmission in glutamatergic and cholinergic systems, restores membrane fluidity, and improves microcirculation by reducing vasospasm and enhancing cerebral blood flow [10].

SSRIs increase serotonin levels by inhibiting its reuptake, addressing serotonin deficiencies linked to depression [11]. Divalproex sodium elevates GABA levels and blocks sodium channels, thereby reducing excitatory glutamate release [12]. Benzodiazepines enhance GABA-mediated chloride influx, promoting CNS depression without directly activating GABA receptors. These agents target various pathways to support neuroprotection, neurotransmission, and recovery in neuropsychiatric conditions [13].

This study aims to gather expert opinion on the clinical use and prescribing practices of psychopharmacological treatments for conditions such as post-stroke aphasia, depression, bipolar disorder (BD), generalized anxiety disorder (GAD), and PTSD with a special focus on medications including citicoline, piracetam, SSRIs, divalproex sodium, and benzodiazepines.

## Methodology

A cross-sectional study was conducted among experts in neuropsychiatry across routine healthcare settings in India from June 2024 to December 2024. The study was performed after obtaining approval from Bangalore Ethics, an Independent Ethics Committee, which was recognized by the Indian Regulatory Authority, the Drug Controller General of India.

An invitation was sent to clinical professionals across India based on their expertise and experience in treating neuropsychiatric disorders in the month of March 2024 for participation in this Indian survey. About 174 clinicians from major cities of all Indian states, representing the geographical distribution, shared their willingness to participate and provide necessary data. Clinicians had the discretion to skip questions they did not wish to answer. They were instructed to complete the questionnaire independently, without seeking input from other study participants. Prior to study commencement, each participant provided written informed consent. Unanswered questions were treated as non-attempts.

The questionnaire booklet titled CITRINE study (Clinicians' Opinion on Psychiatric Disorder Management) was sent to the doctors who were interested in participating in this study. The CITRINE study questionnaire included 23 questions designed to gather feedback on clinical use, prescription practices, and experiences related to psychopharmacological treatments for neuropsychiatric disorders. It focused on medications such as citicoline, piracetam, selective serotonin reuptake inhibitors (SSRIs), benzodiazepines, and divalproex sodium for conditions including post-stroke aphasia, depression, bipolar disorder (BD), generalized anxiety disorder (GAD), and PTSD.

### Statistical analysis

The data were analyzed using descriptive statistics, with categorical variables presented as percentages to reflect their distribution. Frequency and percentage calculations were performed, and pie and bar charts were generated using Microsoft Excel 2013 (version 16.0.13901.20400).

## Results

Of the 174 study participants, approximately 39% reported seeing 11-20% of patients with post-stroke aphasia in clinical practice each month. Around 39% indicated that neuroprotective agents are frequently prescribed for treating post-stroke aphasia. A majority (71.84%) identified citicoline and piracetam as the drug of choice for post-stroke aphasia (Figure 1).

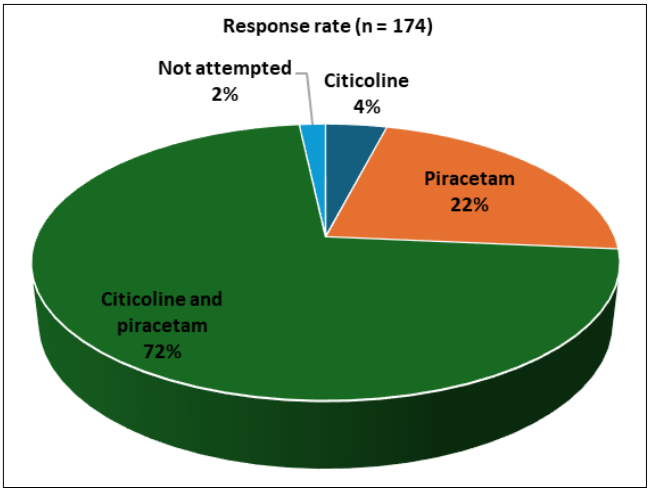


**Fig 1:** Distribution of response to the drug of choice for post-stroke aphasia in routine practice

Around 37% of clinicians preferred the combination of citicoline and piracetam as the first-line therapy for post-stroke aphasia patients. Nearly half (45.98%) reported that the middle-aged group (40-60 years) is the preferred demographic for citicoline and piracetam use in post-stroke aphasia treatment. Approximately 58% of respondents stated that citicoline and piracetam are typically prescribed for 3-4 months in post-stroke aphasia patients. About 45% observed that the combination, when administered in the initial phase of stroke, provides 26-50% beneficial effects. Over half of the respondents (55.75%) opined that the citicoline and piracetam combination is highly effective in improving post-stroke cognitive impairment.

Regarding depression, approximately 46% of clinicians identified the 31-40-year age group as the most commonly affected demographic in clinical practice. Around 67% stated that the prevalence of depression is comparable between the rural and urban populations. According to 59% of experts, cardiovascular disease (CVD) and endocrine dysfunction are the most common physical illnesses co-occurring with depression as comorbidities (Table 1).

**Table 1:** Distribution of responses to the most common physical illness with depression as a co-morbidity seen in clinical practice

| Common illness | Response rate (n = 174) |
|---|---|
| Chronic life-threatening illnesses like human immunodeficiency virus/ acquired immunodeficiency syndrome and cancer | 7.47% |
| Systemic illness- cardiovascular disease and endocrine dysfunction | 58.62% |
| Traumatic illness causing physical impairment | 31.03% |
| All of the above | 0.57% |
| Not attempted | 2.3% |

Approximately 43% stated that obsessive-compulsive disorder is the frequently observed psychiatric comorbidity with depression in clinical practice. Most participants (75.86%) favored SSRIs as the first-line treatment for depression (Table 2). About 46% considered desvenlafaxine the second-choice treatment after SSRIs.

According to 56% of respondents, a lack of understanding and support is the primary reason for non-adherence to antidepressants in depression treatment. Around 65% recommended cognitive behavioral therapy (CBT) alongside medication for patients with depression (Table 3).

**Table 2:** Distribution of responses to the preferred antidepressant choice in clinical practice

| Preference | Response rate (n = 174) |
|---|---|
| Tricyclic antidepressants | 4.6% |
| Serotonin and norepinephrine reuptake inhibitors | 17.24% |
| Selective serotonin reuptake inhibitors | 75.86% |
| Not attempted | 2.3% |

**Table 3:** Distribution of responses to the timing of initiating CBT for depression patients

| Time of initiation | Response rate (n = 174) |
|---|---|
| Before initiating medication | 8.62% |
| After taking a few months of medication | 24.14% |
| Should be given along with medication | 64.94% |
| Not attempted | 2.3% |

For BD, around 46% of clinicians reported seeing 11-20 BD patients weekly in routine practice. Approximately 62% of experts preferred divalproex sodium as the first-line drug for managing BD. A large majority (82%) identified divalproex sodium as the drug of choice for managing rapid cycling episodes of BD (Fig. 2).

In the management of GAD, nearly 71% of experts favored a combination of SSRIs and benzodiazepines for initial treatment (Fig. 3). About 43% preferred escitalopram as the most commonly prescribed SSRI for GAD. According to 67% of respondents, SSRIs are the drug of choice for daytime anxiolytic treatment (Fig. 4). Approximately 82% of participants reported that both pharmacotherapy and psychotherapy are preferred for treating patients with PTSD in clinical practice (Table 4).

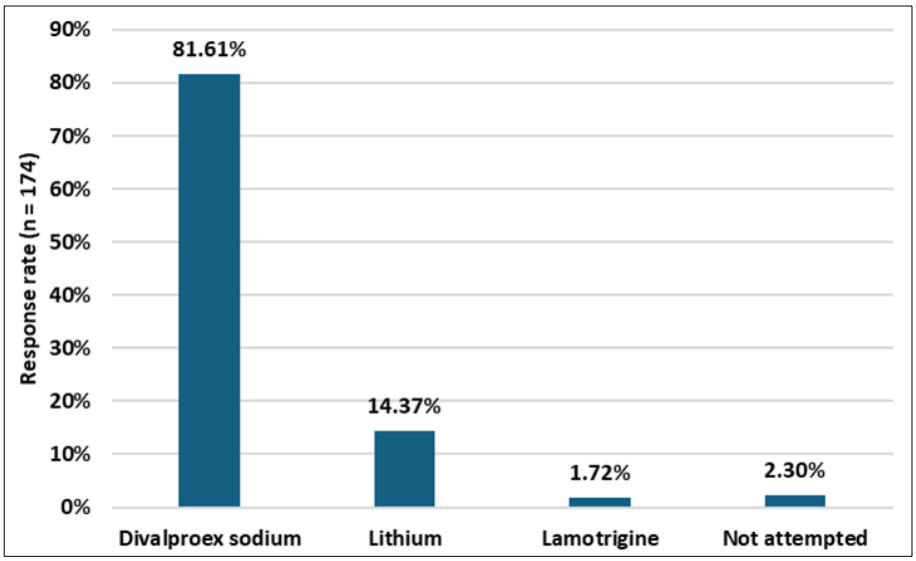


**Fig 2:** Distribution of responses to the drug of choice for rapid cycling episodes of BD in clinical practice

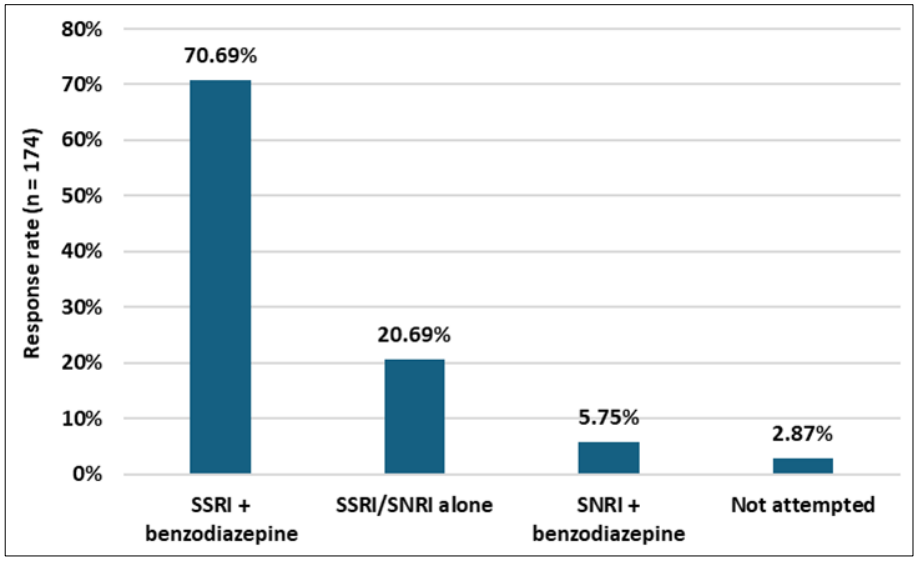


**Fig 3:** Distribution of responses to the preferred initial management for GAD

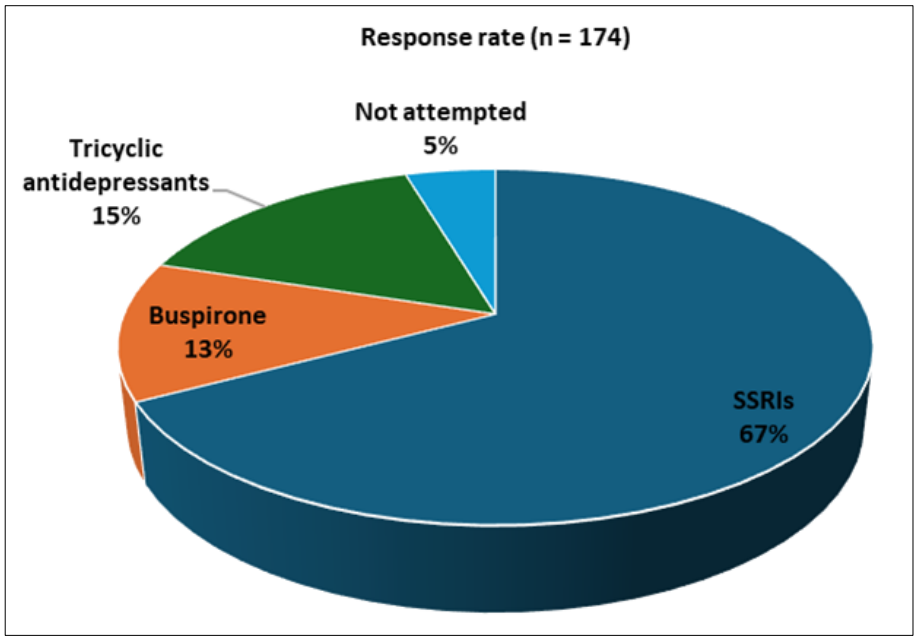


**Fig 4:** Distribution of responses to the drug of choice for daytime anxiolytics

**Table 4:** Distribution of responses to the preferred treatment for PTSD patients in clinical practice

| Preference | Response rate (n = 174) |
|---|---|
| Pharmacotherapy alone | 6.32% |
| Psychotherapy | 9.2% |
| Both | 82.18% |
| Not attempted | 2.3% |

## Discussion

The study findings emphasize the importance of early intervention and combination therapies (both pharmacological and psychological) across neuropsychiatric disorders. A significant portion of the study participants identified citicoline and piracetam as the preferred treatment for post-stroke aphasia, reinforcing their clinical relevance in neurorehabilitation. According to Álvarez-Sabín and Román, citicoline is both safe and effective, playing a crucial role in reducing post-stroke cognitive decline and promoting functional recovery. Long-term use of citicoline at appropriate doses has been shown to be well tolerated while supporting endogenous neurogenesis and neurorepair, thereby enhancing the benefits of physical therapy and rehabilitation [14]. Additionally, a review by Huber summarized evidence that piracetam improves aphasia in acute stroke cases. When used as an adjunct to language therapy, piracetam has been found to be beneficial in both post-acute and chronic aphasia, suggesting its potential for long-term neurocognitive recovery [15].

More than half of the study respondents identified cardiovascular disease (CVD) and endocrine dysfunction as the most prevalent physical illnesses co-occurring as comorbidities with depression. This aligns with the findings by Frank *et al.*, which concluded that endocrine, musculoskeletal, and vascular diseases, rather than psychiatric disorders, are the most common causes of hospitalization in individuals with depression [16]. Similarly, Li *et al.* found that patients with CVD are significantly more likely to experience comorbid depression, highlighting the bidirectional relationship between mental and cardiovascular health [17]. Bondar *et al.* also emphasized that depression and ischemic heart disease are both widespread, serious chronic conditions that pose significant global public

health challenges [18]. Furthermore, Tsuyoshi Shiga's research reinforced that depression is a well-established risk factor for poor cardiovascular outcomes in patients with CVD, with an estimated prevalence of depression in CVD patients at approximately 20% [19]. This highlights the importance of integrating mental health screening and intervention into routine cardiovascular care to improve overall patient outcomes.

The majority of study participants preferred SSRIs as the first-line treatment for depression in clinical practice. This aligns with findings by Chu and Wadhwa, who identified SSRIs as the most commonly prescribed class of antidepressants due to their safety, effectiveness, and tolerability. Given their broad therapeutic applications, SSRIs are frequently used as the initial pharmacological treatment for depression and various other psychiatric conditions and are approved for both adult and pediatric populations [11].

In addition to pharmacotherapy, most clinicians in the survey recommended combining CBT with medication for managing depression. Sudak's research supports this approach, demonstrating that CBT, when used alongside pharmacotherapy, enhances treatment response rates and prolongs the durability of remission once medication is discontinued [20]. Similarly, Hollon *et al.* found that combining cognitive therapy with antidepressant medication significantly improves recovery rates in major depressive disorder (MDD), particularly in patients with severe, non-chronic depression, compared to medication alone [21].

A significant majority of study participants selected divalproex sodium as the preferred treatment for managing rapid cycling episodes of BD. Shah *et al.* found that divalproex sodium was well-tolerated in BD, with mild adverse events (89.0%) and moderate adverse events (10.9%) [22]. Similarly, Davis *et al.* highlighted that divalproex sodium, an anticonvulsant, has proven efficacy in treating bipolar I disorder, particularly during manic or mixed episodes [23].

In the treatment of GAD, the majority of survey participants preferred a combination of SSRIs and benzodiazepines as the initial approach. Dunlop and Davis highlighted several benefits of this combination, including faster anxiety control, reduction of SSRI-induced anxiety or agitation that may occur early in treatment, improved adherence to antidepressant therapy, and better management of episodic or situational anxiety triggered by specific stimuli. However, these advantages must be carefully weighed against potential risks, such as side effects, medication misuse, and the possibility of worsening depressive symptoms [24]. Many survey participants also identified SSRIs as the preferred choice for daytime anxiolytics. Cassano *et al.* found that SSRIs, originally developed for depression, are also effective for treating various anxiety disorders [25]. Similarly, Strawn *et al.* concluded that in adults with GAD, SSRIs and SNRIs are considered first-line pharmacological treatments [26].

In the current study, most participants favored a combination of pharmacotherapy and psychotherapy for treating PTSD in clinical practice. Megan Ehret noted that while some guidelines recommend pharmacotherapy as a first-line treatment, others suggest starting with psychotherapy before considering medication. When pharmacotherapy is chosen, SSRIs and SNRIs, including sertraline, fluoxetine, paroxetine, and venlafaxine, are considered first-line options [27]. Similarly, Haller *et al.* concluded that both pharmacotherapy and psychotherapy are effective treatments for PTSD [28]. Hetrick also indicated that guidelines recommend a combination of both psychological therapy and pharmacotherapy, especially for patients with more severe PTSD or those who have not responded to either treatment alone [29]. These findings underscore the importance of a multimodal approach in PTSD management to optimize patient outcomes.

The study provides valuable insights into clinical practices for treating post-stroke aphasia, depression, BD, GAD, and PTSD, with a focus on psychopharmacological agents such as citicoline, piracetam, SSRIs, divalproex sodium, and benzodiazepines. It highlights the importance of personalized treatment approaches and underscores the need for ongoing education and support to enhance patient adherence and treatment outcomes. The key strengths of this study include its large sample size (174 participants), which offers diverse perspectives on medication preferences and treatment practices across different clinical settings. However, the study also has limitations, including potential selection bias in participant demographics and the self-reported nature of the data, which may introduce recall bias. Additionally, the study does not account for variations in treatment outcomes or long-term efficacy, which are critical factors in evaluating the overall effectiveness of these therapeutic approaches. Future research should focus on longitudinal studies to assess real-world treatment effectiveness and adherence patterns.

## Conclusion

The study provides a comprehensive overview of current clinical practices in the treatment of post-stroke aphasia, depression, BD, GAD, and PTSD. Citicoline and piracetam are widely favored for post-stroke aphasia, with many clinicians reporting significant cognitive recovery benefits. SSRIs are the most commonly prescribed antidepressants, with a notable preference for combining medication with CBT. Divalproex sodium is identified as the first-line treatment for BD, particularly for managing rapid cycling episodes. In GAD, a combination of SSRIs and benzodiazepines is commonly used, while both pharmacotherapy and psychotherapy are preferred for PTSD management.

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