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Effectiveness Of Psychoeducation On The Recurrence Prevention Of Bipolar I Disorder Symptoms: A Comparative Study Of Individual And Family Interventions

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ABSTRACT

The increasing burden of chronic illnesses, including Bipolar I Disorder, has necessitated the exploration of complementary treatments alongside conventional psychiatric interventions. This study investigates the effectiveness of psychoeducation as a supplementary treatment in preventing the recurrence of Bipolar I Disorder symptoms, specifically comparing individual psychoeducation and family-based psychoeducation. A sample of 66 patients diagnosed with Bipolar I Disorder was selected and randomly assigned to one of three groups: individual psychoeducation, family-based psychoeducation, and a control group receiving only standard psychiatric care. The study employed the Young Mania Rating Scale (YMRS) and Hamilton Depression Rating Scale (HDRS) to assess manic and depressive symptoms, while laboratory measures of lithium and bilirubin levels were monitored. Data were collected at three points: pre-test, post-test, and follow-up .

The findings revealed significant differences in manic symptoms and lithium levels between the groups. Specifically, the family-based psychoeducation group, combined with pharmacotherapy, showed significantly lower mean scores in manic symptoms and higher lithium levels compared to the control group at both post-test and follow-up. No significant effects were observed for depressive symptoms or bilirubin levels across the groups .

These results suggest that family-based psychoeducation effectively controls manic symptoms by increasing lithium levels in patients, both in the short and long term. Therefore, integrating family-based

psychoeducation with psychiatric treatment is recommended to prevent unexpected recurrences of manic episodes in patients with Bipolar I Disorder. However, the study did not find evidence of efficacy in addressing depressive symptoms or bilirubin levels.

Keywords: Bipolar I Disorder, Individual Psychoeducation, Family Psychoeducation, Depression, Mania, Lithium, Bilirubin.

1. Introduction

1.1 Problem Statement

In recent decades, one of the biggest challenges that healthcare systems worldwide face is the increasing prevalence and burden of chronic diseases. Chronic diseases, which include both communicable and non-communicable diseases, are among the leading causes of death and disability in both developed and developing countries, including Iran. These diseases impose significant costs on society and the healthcare system due to their recurrent relapses, the modernization of people's lifestyles, increased exposure to multiple risk factors, and the frustration of patients, families, and healthcare teams. The burden of diseases that health systems must manage has significantly shifted due to various factors, including demographic changes, lifestyle choices, and the interplay between communicable and noncommunicable diseases (NCDs). (Pius, Omoruyi et al., 2023).

Studies show that although medication therapy is considered the main treatment method for chronic patients, less than half of the patients achieve a long-term response to this type of treatment, and many of them do not fully recover (Akiskal, 2009; Zhang et al., 2014)and also Chronic conditions often lead to functional impairments, affecting daily activities and overall quality of life(Michael, Linden. (2022). On the other hand, the condition of many patients reflects their very low adherence to medication treatments (Abdollahi et al., 2016). Additionally, the prolonged nature of the treatment process for chronic diseases has adverse effects on the individual patient, their families, and their surroundings, including psychological and social problems that can lead to frequent relapses and high treatment costs (Swartz et al., 2014; Kodai et al., 2017) A study on hypertensive and diabetic patients revealed that 66% were non-adherent to their medication, primarily due to forgetfulness, fear of side effects, and financial constraints (P., R., Thirumalaikumar., et al., 2024).

Bipolar disorder (BD) is recognized as a chronic and severe mental health condition, often leading to significant functional impairments. The disorder's complexity is underscored by its heterogeneous clinical course and the multifaceted factors influencing outcomes. BD is associated with persistent functional impairments, affecting both neurocognitive and psychosocial domains (Andreas, et al., 2022). A global study involving 13 cohorts revealed that around 16% of participants experienced severe functional limitations, highlighting the disorder's impact across diverse populations (Janice, Fullerton., Melvin, McInnis. 2023). BD is characterized by recurrent mood episodes, which can lead to long-term disability if untreated((2022). (4)).The disorder encompasses various forms, including bipolar I and II, each presenting unique challenges and potential for severe impairment(Ana, Gomes., Pedro, Nobre. (2021).).Treatment Challenges Effective management requires complex treatment strategies, as patients often face comorbidities that complicate their clinical course(Sharon,. et al., 2024)

Monitoring and optimizing treatment adherence are crucial for improving patient outcomes((2022). (4)).

Despite the widespread use of pharmacotherapy, including mood stabilizers like lithium and carbamazepine, the relapse rates in bipolar disorder (BD) remain alarmingly high. This phenomenon can be attributed to several factors that influence treatment efficacy and patient outcomes.

Studies indicate that over half of BD patients experience a relapse within 1-2 years, even with appropriate mood

stabilization(Marco,et al ,.2023)(Trisha, Franzen. (2023).

A survey revealed that mood-stabilizing anticonvulsants and second-generation antipsychotics are frequently prescribed, but lithium is underutilized in certain regions, particularly North America.(Balwinder,et al,.2023)

The integration of cognitive behavioral therapy (CBT) has shown promise in reducing relapse rates, yet its effectiveness may vary based on the frequency of mood episodes(Feng, Cong. (2023).). complexity of BD often necessitates personalized pharmacological combinations, especially for atypical forms (Trisha, Franzen. (2023).While pharmacotherapy remains a cornerstone in managing BD, the persistent high relapse rates underscore the necessity for more comprehensive and individualized treatment strategies.

Therefore, the use of adjunctive therapies alongside pharmacotherapy has been recognized as a necessary need (Abdollahi et al., 2016; Iqzeh et al., 2018).

1.2 Psychoeducation as an Adjunctive Intervention

Psychoeducation has emerged as a vital intervention for patients with bipolar disorder, enhancing both patient and family awareness regarding the condition, symptom recognition, and management strategies. A study in Japan demonstrated that a brief group psychoeducation course significantly reduced hospitalizations among participants, indicating improved self-efficacy and relapse prevention(Atsuko,.et al,.2023). Psychoeducation serves as a "gateway" for treatment adherence, helping patients understand their condition as treatable, which in turn reduces symptoms(Clarissa, Tochetto,.et al,.2023). Research indicates that psychoeducation not only benefits patients but also improves family members' attitudes towards psychological disorders, reducing internalized stigma and fostering a supportive environment (Maryam, Latifian.,et al,.2022). A planned study in Rwanda aims to adapt psychoeducation to local contexts, emphasizing its potential to enhance symptom management and adherence in low-resource settings(E., Musoni-Rwililiza.,et al.2022)

Multiple studies have shown that psychoeducation can effectively help control manic episodes and reduce the recurrence of the disease in patients with Bipolar I disorder (Perlick, 2008; Javadpour, 2013). For example, Poor adherence rates in bipolar disorder range from 20% to 60%, with non-adherent individuals experiencing more manic relapses and lower quality of life[4]. Negative attitudes towards medications are linked to non-adherence, while positive attitudes correlate with better adherence and higher serum levels of mood stabilizers(Jennifer, B., et al,.2020)(Ching-Wen, Chang.,et al,2015). Effective prophylactic treatment with mood stabilizers, such as lithium and valproate, is essential for reducing recurrence rates(D., Khattech.,et al,2023). However, the choice of medication may influence adherence and outcomes differently(D., Khattech.,et al,2023).

1.3 objectives

The primary objective of this study is to evaluate the effectiveness of psychoeducation, delivered either individually or in a family setting, as an adjunctive treatment in preventing the recurrence of symptoms in patients with Bipolar I Disorder. The study aims to determine whether psychoeducation can reduce the frequency and severity of manic and depressive episodes and assess its impact on relevant biological markers, specifically lithium and bilirubin levels. By comparing individual and family-based psychoeducation, the study seeks to identify the most effective approach to enhance long-term outcomes for patients with Bipolar I Disorder.

1.4 Research Hypotheses

This study is based on the following hypotheses:

Hypothesis 1: Family-based psychoeducation, in conjunction with standard psychiatric treatment, will result in a greater reduction in manic symptoms compared to individual psychoeducation and standard treatment alone.

Hypothesis 2: Both individual and family-based psychoeducation will significantly reduce depressive symptoms in patients with Bipolar I Disorder.

Hypothesis 3: Psychoeducation will lead to higher lithium levels, contributing to mood stabilization and reduced

relapse rates.

Hypothesis 4: There will be no significant change in bilirubin levels as a result of psychoeducation interventions.

2. Literature Review

This Section will provide a detailed examination of bipolar disorder, including its definitions and historical background, diagnostic symptoms, available clinical treatments, course and prognosis, and differential diagnosis. It will also include a comprehensive analysis of psychoeducation, dividing it into individual and family psychoeducation, and reviewing the effectiveness of psychoeducational interventions for bipolar disorder patients. Finally, relevant biological markers associated with bipolar disorder, including lithium and bilirubin, will be analyzed.

2.1Bipolar Disorder

Bipolar disorder (BD) is a complex mood disorder characterized by significant mood fluctuations, including episodes of mania and depression. These alternating states can severely impact an individual's functionality and quality of life. Understanding the nature, symptoms, and treatment options for BD is crucial for effective management.

- BD manifests through extreme mood states: manic episodes involve elevated mood, increased energy, and impulsivity, while depressive episodes are marked by low energy and despondency (Fernando, S., Goes. (2023).
- Early diagnosis is challenging, often leading to misdiagnosis and delayed treatment, which can exacerbate the condition (Fernando, S., Goes. (2023).
- First-line treatments include lithium, which remains the gold standard for mood stabilization, although newer atypical antipsychotics are gaining recognition (Jennifer, Burgess.,et al,2024)
- A holistic approach that integrates psychosocial support and lifestyle changes is recommended to enhance treatment efficacy and patient quality of life (Richard, Morriss. (2024)).

Mood disorders significantly disrupt an individual's emotional state, leading to profound impacts on their social, occupational, and interpersonal functioning. These disorders, including unipolar depression and bipolar disorder, are characterized by persistent and pervasive abnormalities in mood, which can manifest as either elevated or depressed states((2022).).Research indicates that higher psychological flexibility can buffer against the negative effects of mood disturbances, allowing individuals to better navigate upsetting events and environments(Jeanette, Villanueva.,et al,2023).

Historical Background and Classification:

Mood disorders have evolved significantly in classification and understanding since ancient times. Initially described by Hippocrates, the concept was later refined by Emil Kraepelin and Karl Leonhard, who introduced a more structured classification. This evolution reflects a growing comprehension of the complexities of mood disorders, which encompass a range of conditions.

Hippocrates identified "mania" and "melancholy," laying the groundwork for future classifications of mood disorders (Kay, Redfield, Jamison. (2023).).Emil Kraepelin's term "manic-depressive psychosis" unified these conditions under a single umbrella, emphasizing the cyclical nature of mood disorders ((2022). (5)).Karl Leonhard's 1962 classification divided mood disorders into unipolar depression, unipolar mania, and bipolar disorder, highlighting the distinct characteristics of each (2022).Current classifications, such as those in the DSM-5, further refine these categories, acknowledging the complexities and variations in symptoms ((2022). (5)).

Despite advancements, diagnosing mood disorders remains challenging due to symptom overlap and variations in individual presentations ((2022). (5))(Diego, J.,et al,2021)

The broad construct of bipolar depression raises concerns about its validity and the need for more precise diagnostic criteria (Diego, J.,et al,2021).

In summary, while the understanding of mood disorders has progressed, ongoing challenges in diagnosis and classification highlight the need for continued research and refinement in this field.

Today, Mood disorders are primarily classified into unipolar depression and bipolar disorders, with the latter further divided into several types, including Bipolar I, Bipolar II, Cyclothymic Disorder, and Other Specified Bipolar and Related Disorders. Understanding these classifications is crucial for accurate diagnosis and treatment.

Unipolar Depression: Characterized by persistent depressive episodes without manic or hypomanic episodes. It includes major depressive disorder and persistent depressive disorde.(Denys, Aleksandrov,.et al,2024)

Bipolar Disorders: Defined by the presence of manic or hypomanic episodes alongside depressive episodes. Bipolar I involves severe manic episodes, while Bipolar II features hypomanic episodes without full-blown mania (Denys, Aleksandrov,.et al,2024) (Vanja, Bosić.,et al,2024).

Symptoms and Signs:

Individuals with bipolar disorder may experience different phases of mania and depression. Symptoms of mania include an extremely elevated mood, increased energy, reduced need for sleep, grandiose thoughts, and aggressive behavior. In contrast, depressive symptoms include a low mood, reduced energy, feelings of guilt, and suicidal thoughts (Sanmukhani et al., 2011).

Mood Episodes

- Depressive Episode

  A depressive episode in bipolar disorder is marked by a depressed mood and loss of interest and pleasure in most activities. This episode must last at least two weeks and include symptoms such as changes in appetite, sleep, energy, feelings of guilt, and suicidal thoughts (American Psychiatric Association, 2013)**.**

- Mania Symptoms

  Symptoms of mania include increased energy, an extremely elevated mood, racing thoughts, decreased need for sleep, unusual behaviors, and unrealistic beliefs about one's abilities (San et al., 2016)**.**

- Mixed Episode

  A mixed episode is characterized by simultaneous symptoms of mania and depression and may include rapid mood swings, restlessness, and suicidal thoughts. This episode must last at least one week and can significantly impair social and occupational functioning (American Psychiatric Association, 2013)**.**

2.2 Course and Prognosis

Bipolar I Disorder typically begins in late adolescence or early adulthood and is usually recurrent. The prevalence of this disorder in various studies ranges from 2.8% to 6.5%, with an annual incidence rate of less than 1% (Kaplan & Sadock, 2009).

2.3 Familial Pattern

First-degree relatives of individuals with Bipolar I Disorder have a higher rate of this disorder and other mood disorders. Evidence of genetic influence for Bipolar I Disorder has been obtained from twin and adoption studies (American Psychiatric Association, 2013).

2.4 Differential Diagnosis

Bipolar I Disorder should be distinguished from major depressive disorder, dysthymic disorder, and other psychiatric disorders. Differential diagnosis involves differentiating mood disorders from other psychiatric conditions such as psychotic disorders and disorders resulting from brain injuries (Kaplan & Sadock, 2009).

2.5 Comorbidities

Comorbid conditions with bipolar disorder include anxiety disorders, substance abuse, eating disorders, and personality disorders. These comorbidities can complicate the treatment of bipolar disorder (Goodwin, 2007).

2.6 Suggested Treatments in Clinical Research

Psychotherapy

- Cognitive Behavioral Therapy (CBT): Focuses on changing inappropriate thought and behavior patterns and improving individual control (Corsentino, 2014).
- Psychoeducation: Education about bipolar disorder, treatment methods, and recognizing early signs of new episodes (Andrescu, 2008).
- Family Therapy: Reduces family distress and teaches effective ways to support bipolar patients (Anders, 2014).
- Interpersonal Therapy: Improves interpersonal relationships and regulates sleep patterns (Sanmukhani et al., 2011).
- Group Therapy: Focuses on disease acceptance and the need for long-term medication (San et al., 2016).

2.7 Psychoeducation

Psychoeducation is an effective tool in treating bipolar disorder and involves educating about the symptoms of the illness, triggering factors, coping strategies, and reducing emotional stress. This education can be provided individually or in groups, for patients and their families (Chen et al., 2006).

Classification of Psychoeducation:

- Individual Psychoeducation: Focused on the specific needs of the individual patient.
- Family Psychoeducation: Focused on educating the family about the disorder and how to support the patient.

Psychoeducation, as a complementary approach alongside pharmacological treatment, can enhance the quality of life for bipolar disorder patients and reduce the frequency of relapse.more effective management of bipolar disorder (Freestad et al., 2009; Kim et al., 2015).

2.8 Previous Studies

Research indicates that bipolar disorder not only affects the life of the individual but also impacts the overall functioning of the family. The diagnosis of one family member with this disorder can lead to decreased family adaptability and increased stress and family problems (Lyrica, Shimizu., et al,2024) In this context, family psychoeducation is highlighted as an effective approach for managing the challenges associated with the disorder and enhancing the supportive capabilities of families (Maryam, Yosefi, Tabas.,et al,2024)

Studies show that when family members are considered part of the treatment team, they can provide more effective support to the patient. This support helps in acquiring necessary information about the illness and creating conditions conducive to preventing relapse (G., P., Kaviya, et al,.2024)Some research suggests that family psychoeducation can increase patient survival rates and reduce behavioral problems (Salvatore, Iuso.,et al,2023)

Other benefits of family psychoeducation include raising awareness among families and patients about prodromal symptoms and better management of relapses. This type of education can lead to a reduction in hospitalization rates and improvement in patients' quality of life (Hunny, Kalra., S., Tung. 2024). Additionally, family psychoeducation can contribute to reducing family stress and enhancing the social functioning of patients (Maulidia, Rahima,.et al,2024)

Research has shown that both individual and group psychoeducation can have positive effects on the treatment of bipolar disorder. However, family psychoeducation, due to its emphasis on increasing collaboration and coordination among family members, is particularly effective in reducing symptoms and preventing relapse (E., Musoni-Rwililiza.,et al,2022)

Psychoeducation also has the potential to improve patients' social functioning and reduce risky behaviors. Recent advancements indicate that combining psychoeducation with pharmacological treatments generally leads to better outcomes compared to pharmacological treatments alone(Elisabet, Casellas.,et al,2021)

Ultimately, the use of psychoeducation as a validated treatment method alongside physical treatments can help

improve patients' clinical status and reduce symptoms. These educational programs can be conducted either in groups or individually, providing families with tools for

3. Methodology

3.1 Research Design

This study employs a randomized clinical trial design with a pre-test, post-test, and follow-up methodology, involving two experimental groups and one control group. The aim is to evaluate the effects of psychoeducational interventions alongside standard drug therapy in patients with bipolar I disorder.

3.2 Participants

Population: The study focuses on chronic psychiatric patients diagnosed with bipolar I disorder, who are under the care of a rehabilitation center in Semnan, Iran.

- Sample Size: From 75 eligible female outpatients diagnosed with bipolar I disorder, 66 were selected based on specific inclusion criteria and divided into three groups (22 participants each) using purposive sampling.
- Inclusion Criteria:
  - Female patients diagnosed with bipolar I disorder (DSM-5).
  - Literacy (ability to read and write).
  - Support from family (presence of parents during the study).
  - Consistent medication regimen for at least two months before the study.
- Exclusion Criteria:
  - Presence of comorbid psychiatric disorders.
  - Use of psychotropic substances or specific medications like fluoxetine.
  - Pregnancy or significant physical illnesses such as epilepsy or diabetes.

3.3 Intervention

Participants were randomly assigned to one of three groups:

1. **Control Group**: Received only standard drug therapy (lithium treatment).
2. **Experimental Group 1**: Received individual psychoeducation sessions alongside drug therapy.
3. **Experimental Group 2:** Received family-focused psychoeducation alongside drug therapy.

Both interventions were carefully designed to prevent cross-interaction between the groups. The sessions were scheduled to avoid overlap.

3.4 Data Collection

- Assessment Tools:
  - Hamilton Depression Rating Scale (HDRS): Measures depression severity.
  - Young Mania Rating Scale (YMRS): Assesses the severity of manic episodes.
  - Lithium and Bilirubin Tests: Conducted to monitor therapeutic drug levels and liver function.
- Procedure: Pre-tests were administered before the intervention, and post-tests were conducted immediately after the intervention and four months later to assess long-term effects.

1.1. Statistical Analysis

The collected data were analyzed using ANCOVA to control for potential confounding variables and to assess the effectiveness of the psychoeducation interventions.

4. Results

In this section of the research, data related to depression and mania variables, as well as two laboratory variables—serum lithium levels and blood bilirubin levels—are examined across three groups: 1) Medication-only group (control

group), 2) Medication combined with family psychological education, and 3) Medication combined with individual psychological education. The aim of this chapter is to perform statistical analysis of the data to evaluate the effects of different interventions on patients with Bipolar I Disorder.

First, descriptive data obtained from questionnaires and tests are presented along with relevant charts. To test the research hypotheses, Multivariate Analysis of Covariance (MANCOVA) is used.

4.1 Descriptive Statistics of Variables

This section presents the mean and standard deviation of depression, mania, serum lithium levels, and bilirubin levels in the three groups at three stages (pre-test, post-test, and follow-up) and analyzes these data.

Table 4-1: Descriptive Statistics for Depression Variable

Stage	Group	Mean	Standard Deviation	N
Pre-test	Family Education	9.04	3.39	22
	Individual Education	9.22	1.77	22
	Medication-only	9.54	2.34	22
Post-test	Family Education	8.63	2.78	22
	Individual Education	7.04	1.76	22
	Medication-only	7.18	1.76	22
Follow-up	Family Education	9.04	2.93	22
	Individual Education	8.45	1.76	22
	Medication-only	8.72	1.86	22

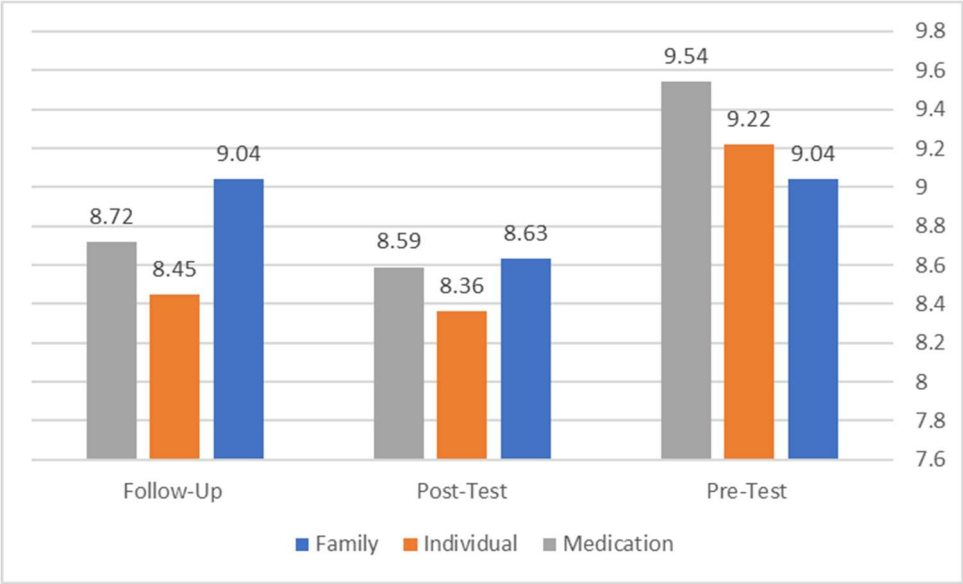

Figure 4-1: Descriptive Statistics for Depression Variable Across Different Stages

In figure 4.1 In the family psychological education intervention, a decrease of about 1 point is observed in the post-test stage and no change in the follow-up stage compared to the pre-test. In the individual psychological education intervention, a decrease of about 2 points in the post-test stage and about 1 point in the follow-up stage compared to the pre-test is observed. In the medication-only group, a decrease of about 2 points in the post-test stage and about 1 point in the follow-up stage compared to the pre-test is noted.

Table 4-2: Descriptive Statistics for Mania Variable

Stage	Group	Mean	Standard Deviation	N
Pre-test	Family Education	29.59	7.18	22
	Individual Education	29.68	6.44	22
	Medication-only	30.09	5.97	22
Post-test	Family Education	22.68	3.15	22
	Individual Education	25.59	4.59	22
	Medication-only	27.09	5.72	22
Follow-up	Family Education	24.00	3.81	22
	Individual Education	26.90	5.01	22
	Medication-only	26.90	5.01	22

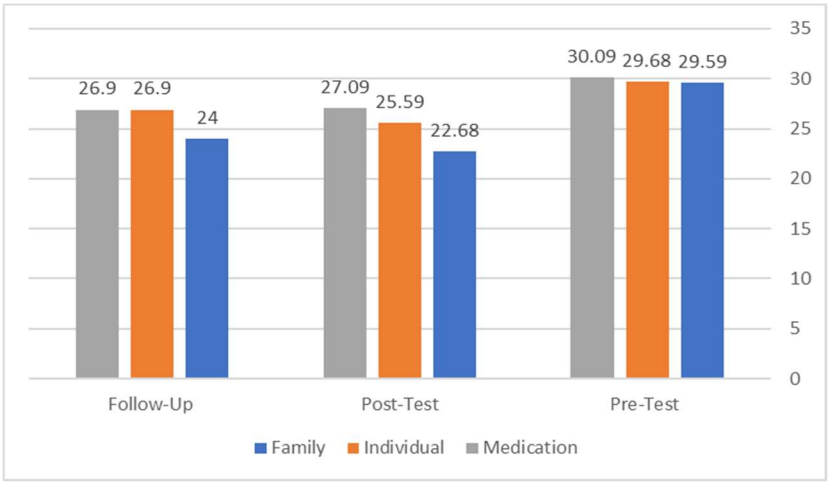

Figure 4-2: Descriptive Statistics for Mania Variable Across Different Stages

In Figure 4.2 In the family psychological education intervention, a decrease of about 7 points in the post-test stage and about 5 points in the follow-up stage compared to the pre-test is observed. In the individual psychological education intervention, a decrease of about 4 points in the post-test stage and about 5 points in the follow-up stage compared to the pre-test is noted. In the medication-only group, a decrease of about 3 points in the post-test stage and about 2 points in the follow-up stage compared to the pre-test is observed.

Table 4-3: Descriptive Statistics for Lithium Variable

Stage	Group	Mean	Standard Deviation	N
Pre-test	Family Education	0.763	0.083	22
	Individual Education	0.722	0.102	22
	Medication-only	0.770	0.103	22
Post-test	Family Education	0.926	0.134	22
	Individual Education	0.812	0.092	22

	Medication-only	0.841	0.109	22
Follow-up	Family Education	0.875	0.097	22
	Individual Education	0.807	0.096	22
	Medication-only	0.819	0.105	22

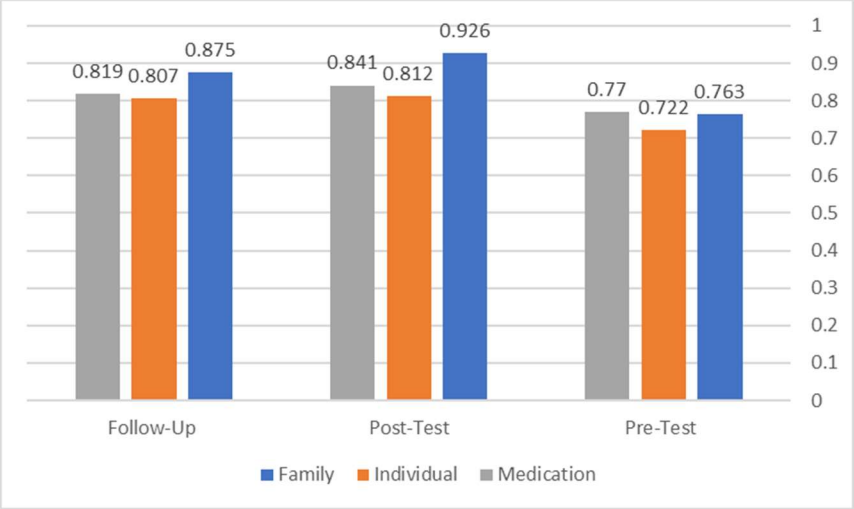

Figure 4-3: Descriptive Statistics for Lithium Variable

In figure 4.3 : In the family psychological education intervention, an increase of 0.16 microequivalents/liter in the post-test stage and 0.11 microequivalents/liter in the follow-up stage compared to the pre-test is observed. In the individual psychological education intervention, an increase of 0.04 microequivalents/liter in the post-test stage and 0.03 microequivalents/liter in the follow-up stage compared to the pre-test is noted. In the medication-only group, changes in the post-test stage are 0.07 and in the follow-up stage are 0.04 increase compared to the pre-test.

Table 4-4: Descriptive Statistics for Bilirubin Variable

Stage	Group	Mean	Standard Deviation	N
Pre-test	Family Education	0.419	0.061	22
	Individual Education	0.463	0.064	22
	Medication-only	0.454	0.059	22
Post-test	Family Education	0.395	0.048	22
	Individual Education	0.386	0.061	22
	Medication-only	0.423	0.105	22
Follow-up	Family Education	0.387	0.060	22
	Individual Education	0.384	0.058	22
	Medication-only	0.407	0.051	22

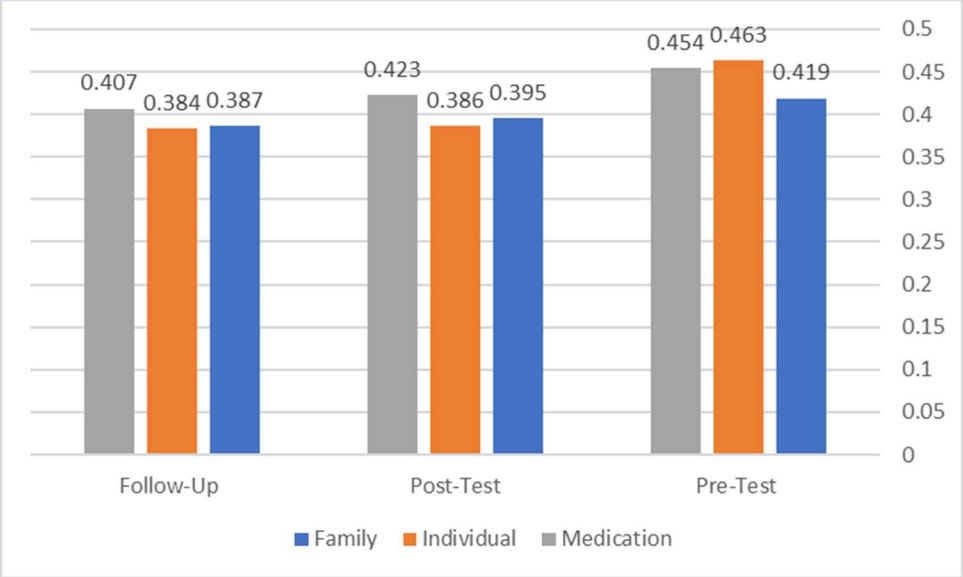

Figure 4-4: Descriptive Statistics for Bilirubin Variable

In Figure 4.4: In the family psychological education intervention, a decrease of 0.02 milligrams per deciliter in the post-test stage and 0.03 milligrams per deciliter in the follow-up stage compared to the pre-test is observed. In the individual psychological education intervention, a decrease of 0.08 milligrams per deciliter in both the post-test and follow-up stages compared to the pre-test is noted. In the medication-only group, a decrease of 0.03 milligrams per deciliter in the post-test stage is observed.

4.2 Data Analysis and Hypothesis Testing

In this study, multivariate analysis of covariance (MANCOVA) was used to examine the hypotheses and answer the research questions. The normality of the data distribution was first assessed, and after confirming the necessary assumptions, the hypotheses were tested using this statistical method.

1. Normality Test of Depression and Mania Variables

Based on the results of the Kolmogorov-Smirnov test (Table 4-5), the significance levels for the variables of Young Mania and Hamilton Depression are greater than 0.05, confirming the normality assumption for these variables.

Table 4-5. Kolmogorov Smirnov test results

Young Pre-test	Young Follow-up	Young Post-test	Hamilton Pre-test	Hamilton Post-test	Hamilton Follow-up	Variable	
0/191	0/227	0/177	0/188	0/136	0/166	Kolmogorov-Smirnov	Family
0/056	0/054	0/073	0/053	0/2	0/177	Significance Level:	

2. M Box Test for

0/182	0/174	0/192	0/169	0/144	0/238	Kolmogorov-Smirnov	Individual
0/055	0/083	0/054	0/104	0/2	0/052	Significance Level:	
0/119	0/123	0/119	0/229	0/180	0/198	Kolmogorov-Smirnov	Medication
0/2	0/2	0/2	0/054	0/061	0/055	Significance Level:	

Equality of Covariance Matrices

According to Table 4-6, the M Box test, with a value of 43.91 and an F index of 1.99 at a significance level of 0.005, indicates that the covariance matrices for the research variables are not equal. Therefore, in addition to Wilks' Lambda, the Pillai's Trace effect size is also reported in the multivariate analysis of variance (MANOVA).

Table 4-6. Mbox for testing equality of covariance matrix

Box's M Statistic:	91/43
F Value:	99/1
Degrees of Freedom 1:	20
Degrees of Freedom: 2	954/14246
Significance:	005/0

3. Multivariate Effects Testing

The results of the multivariate effects test (Table 4-7) show that Wilks' Lambda is 0.561, with an F value of 4.852 and degrees of freedom of 116, which is significant at the 0.001 level. Additionally, the Levene's test suggests that the error variances are equal.

Table 4-7. Multivariate effects test

Partial Eta Squared	Significance	Error Degrees of Freedom:	Error Hypothesis	F	value		Effect
183/0.	018/0	58	4	251/3	183/0	Pillai's Trace	Constant
183/0	018/0	58	4	251/3	817/0	Wilks' Lambda	
223/0	001/0	118	8	234/4	446/0	Pillai's Trace	Group
251/0	001/0	116	8	852/4	561/0	Wilks' Lambda	

4. Individual Psychoeducation and Family Psychoeducation in Preventing Relapse of Bipolar Disorder Type I Symptoms

The results in Tables 4-8 and 4-9 indicate that there is no significant difference between individual psychoeducation and the prevention of relapse in Bipolar Disorder Type I ($P<0.001$). However, a significant difference is observed between family psychoeducation and relapse prevention ($P<0.001$).

Table 4-8. Intergroup effects test

Partial Eta Squared	Significance	F	Mean Squares	Degrees of Freedom	Sum of Squares	Dependent Variable	Source
094/0	014/0	346/6	372/33	1	372/33	Young Post-test	

099/0	012/0	688/6	458/6	1	458/6	Hamilton Post-test	Constant
081/0	024/0	350/5	571/27	1	571/27	Young Follow-up	
111/0	008/0	630/7	885/8	1	885/8	Hamilton Follow-up	
356/0	001/0	896/16	851/88	2	70/177	Young Post-test	Group
042/0	269/0	341/1	295/1	2	590/2	Hamilton Post-test	
327/0	001/0	822/14	385/76	2	771/152	Young Follow-up	
097/0	041/0	265/3	802/3	2	605/7	Hamilton Follow-up	
			259/5	61	776/320	Young Post-test	Error
			966/0	61	898/58	Hamilton Post-test	
			153/5	61	359/314	Young Follow-up	
			165/1	61	038/71	Hamilton Follow-up	

Table 4-9. Pairwise comparisons test

Significance	Standard Error	Mean Difference		Group	Dependent Variable	Stage
0/001	0/69	2/783	Individual	Family	Young Mania	Post-test
0/001	0/69	3/91	Medication	Family		
0/31	0/69	1/13	Medication	Individual		
0/50	0/29	0/41	Individual	Family	Hamilton Depression	
0/46	0/29	0/42	Medication	Family		
1	0/29	0/01	Medication	Individual		
0/001	0/68	2/788	Individual	Family	Young Mania	Follow-up
0/001	0/68	3/55	Medication	Family		
0/81	0/68	0/76	Medication	Individual		
0/08	0/32	0/73	Individual	Family	Hamilton Depression	
0/10	0/32	0/70	Medication	Family		
1	0/32	0/02	Medication	Individual		

5. Impact of Individual and Family Psychoeducation on Lithium and Bilirubin Biological Markers

According to the results in Tables 4-10 and 4-11

-Individual psychoeducation does not show a significant difference in the lithium biological marker (P<0.001).

-Family psychoeducation shows a significant difference in the lithium biological marker (P<0.001).

-Neither individual nor family psychoeducation shows a significant difference in the bilirubin biological marker.

Table 4-10. Intergroup effects test

Significance	F Statistic	Mean Squares	Degrees of Freedom	Type III Sum of Squares	Dependent Variable	Source
0/002	6/718	0/068	2	0/135	Post-Test Lithium	Group
0/060	2/942	0/012	2	0/024	Post-Test Bilirubin	
0/015	4/942	0/026	2	0/052	Follow-Up Lithium	
0/020	4/151	0/006	2	0/013	Follow-Up	

Table 4-11. Bilirubin

	0/010	61	0/615	Post-Test Lithium	Error
	0/004	61	0/246	Post-Test Bilirubin	
	0/006	61	0/353	Follow-Up Lithium	
	0/002	61	0/095	Follow-Up Bilirubin	
		66	49/795	Post-Test Lithium	Total
		66	11/035	Post-Test Bilirubin	
		66	46/588	Follow-Up Lithium	
		66	10/398	Follow-Up Bilirubin	

Pairwise comparisons test

Significance	Standard Error	Mean Difference (I-J)	Group J	Group I	Step	Variable
*0/002	0/032	0/0113	Individual	Family	Post-Test	Lithium
*0/029	0/031	0/083	Medication	Family		
1/000	0/030	0/029	Medication	Individual		
*0/019	0/024	0/068	Individual	Family	Follow-Up	
0/067	0/024	0/055	Medication	Family		
1/000	0/023	0/013	Medication	Individual		
0/174	0/020	0/039	Individual	Family	Post-Test	Bilirubin
1/000	0/020	0/004	Medication	Family		
0/088	0/019	0/043	Medication	Individual		
*0/04	0/012	0/032	Individual	Family	Follow-up	
1/000	0/012	0/003	Medication	Family		
0/054	0/012	0/029	Medication	Individual		

4.3 Conclusion

Based on the results, family psychoeducation significantly impacts the prevention of relapse in Bipolar Disorder Type I symptoms and the lithium biological marker. In contrast, individual psychoeducation does not have a significant effect on the lithium marker, and no significant differences are observed in other areas as well.

5. Discussion and result

The evaluates the impact of psychoeducation, both individual and family-based, on preventing the recurrence of Bipolar I Disorder symptoms.

Key Findings:

1. Individual Psychoeducation: The study found that individual psychoeducation had limited effectiveness in preventing the recurrence of Bipolar I Disorder episodes. While some reductions in depressive and manic symptoms were observed during follow-up, these changes were not statistically significant. This finding aligns with previous studies by Christon et al. (2008) and Glassfer, Brown, and Reigrel (2015), which also reported

minimal effectiveness of individual psychoeducation for Bipolar I patients. However, it contradicts the findings of Javadi Pour (2013), who reported a 30% reduction in recurrence after individual psychoeducation in patients on lithium treatment.

2. Family Psychoeducation: The study demonstrated that family psychoeducation was more effective in preventing manic episodes and enhancing lithium treatment outcomes. The results suggest that combining family psychoeducation with medication significantly reduces manic episodes in both the short and long term. This aligns with studies by Rahmani et al. (2017), who found that family psychoeducation improved treatment attitudes and knowledge among families, leading to fewer hospitalizations. The study also echoes findings by Murry (1993) and others, indicating that family psychoeducation can enhance therapeutic alliances and improve clinical outcomes, including lithium blood levels.
3. Biological Markers (Lithium and Bilirubin):

   Lithium: Individual psychoeducation had no significant impact on lithium levels, which is consistent with studies by Autry and Sharma (2007). Conversely, family psychoeducation significantly increased lithium levels, supporting the findings of studies by Suppes (2005) and Clom et al. (2010), which advocate for family involvement in managing Bipolar I Disorder**.**

   Bilirubin: Neither individual nor family psychoeducation showed significant effects on bilirubin levels, though minor fluctuations were noted. This aligns with Yamaguchi et al. (2002), who noted the sensitivity of bilirubin to stress and illness severity**.**
4. Comparative Effectiveness: The study concludes that family psychoeducation is more effective than individual psychoeducation in preventing the recurrence of Bipolar I Disorder symptoms. Family interventions not only reduced manic symptoms but also improved lithium levels and overall treatment adherence, highlighting the importance of family support in managing Bipolar I Disorder.

Overall Conclusion:

The study suggests that while individual psychoeducation offers limited benefits in preventing the recurrence of Bipolar I Disorder symptoms, family psychoeducation is a more effective strategy. The findings emphasize the role of family support in treatment, particularly in enhancing the efficacy of lithium therapy and preventing manic episodes. Further research is recommended to explore ways to increase the effectiveness of individual psychoeducation, particularly for patients who cannot participate in family-based interventions.

6. Suggestions for Future Research

Based on the findings of this study and a review of the relevant literature, the following suggestions are proposed for future research:

1. Independent Studies on Individual and Family Psychoeducation in Bipolar Disorder:

   -Future research should focus on conducting separate studies that explore the effects of individual psychoeducation and family psychoeducation in patients with bipolar disorder. To ensure more precise control of variables, it is recommended that each method be investigated independently, with careful monitoring of related variables**.**
2. Larger-Scale Interventional Studies on Psychoeducation and Bipolar Disorder:

   -Given the predominance of descriptive and comparative studies in the field of psychoeducation and bipolar disorder, there is a need for more large-scale interventional research. Expanding the sample size and focusing on interventional designs will enhance the robustness and generalizability of the findings**.**
3. Comparative Efficacy of Complementary Treatments in Bipolar Disorder:

   -To provide more effective support to the medical community in the treatment of bipolar disorder, future studies should compare the efficacy of various complementary treatments. The focus should be on identifying which treatments offer the highest efficacy in controlling variables related to the recurrence of the disorder**.**
4. Application of Psychoeducation Protocols to Other Types of Bipolar Disorder:

   -The psychoeducation protocols explored in this study should be applied to other types of bipolar disorder, such as Bipolar II Disorder. Comparative analysis of outcomes across different bipolar disorder types could yield valuable insights and inform tailored interventions**.**
5. Utilization of Larger, Gender-Inclusive Samples:

   -To enhance the generalizability of research findings, future studies should utilize larger, more diverse samples that

include participants of both genders. Additionally, it is recommended that researchers investigate potential gender differences in response to psychoeducation and treatment outcomes**.**

These suggestions aim to guide future research efforts in expanding and refining the understanding of psychoeducation and its role in the management of bipolar disorder**.**

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