

Experimental Study

The effect of motivational interviewing and telepsychiatric follow-up on medication adherence of patients with bipolar disorder: A randomized controlled trial

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Abstract

Objectives: This study was conducted to determine the effect of an individualized motivational interview-based program to improve medication adherence with a telepsychiatric complement (by telephone) on outpatients with bipolar disorder in follow-up at a community mental health center.

Methods: A randomized controlled experimental study was conducted with 54 patients who were receiving care for bipolar disorder at a community mental health center post hospitalization. The data were collected using an information form, the Morisky Medication Adherence Scale (MMAS), and the Medication Adherence Rating Scale. A motivational, interview-based program to improve medication adherence consisting of 6 sessions and a total of 240–270 minutes was administered to the experimental group. After the program, SMS medication reminders were sent to the patients in the experimental group for 3 months. The scales were readministered to the experimental and control groups at the end of the third and sixth month to assess medication adherence. Variance analysis, significance test of difference between means, the Friedman test, the Mann-Whitney U test, a chi-squared test, and correlation analysis were used to evaluate the data.

Results: The mean MMAS score in the experimental group was 2.96 ± 0.69 before the program, 0.46 ± 0.83 after 3 months, and 0.14 ± 0.44 after 6 months. The difference in the medication adherence scores of the patients in the experimental group after the program and telephone follow-up was statistically significant ($p < 0.05$). There was no significant change in the medication adherence level in the control group ($p > 0.05$).

Conclusion: The results indicated that the motivational interview and telepsychiatric follow-up techniques were successful and can be used to increase medication adherence of bipolar patients.

Keywords: Bipolar disorder; community mental health center; medication adherence; motivational interview; psychiatric nursing; telepsychiatry.

Drug therapy is a primary component of treatment for bipolar disorder; however, adherence to medication is known to be a challenge. Some 20% to 70% of patients stop taking medication either partially or completely.^[1–4] It has also been reported that at least one-third of bipolar patients fail to take >70% of their prescribed medication.^[5,6] The risk of adherence non-compliance is significant in long-term therapy.

Mechanisms to foster treatment continuity in bipolar patients with medication non-adherence are important.^[7–9] Examination of the causes of non-adherence will assist with the development of effective methods to address non-compliance with medical therapy.^[10]

Studies of bipolar patients have indicated that psychological variables associated with poor medication adherence in-

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Submitted Date: December 02, 2020 **Accepted Date:** February 06, 2022 **Available Online Date:** August 08, 2022

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What is presently known on this subject?

- Medication adherence is of great importance in the treatment of bipolar disorder. However, the non-adherence rate of bipolar patients is known to be quite high. Combined interventions to address the causes of non-adherence have been recommended in the literature, but a search revealed no studies that used motivational interviewing and telephone message follow-up to increase medication adherence in bipolar patients.

What does this article add to the existing knowledge?

- The medication adherence of bipolar patients increased significantly following participation in the motivational interview-based medication adherence program with telepsychiatric follow-up. Comprehensive interventions that support self-guided behavior change can result in sustained improvement.

What are the implications for practice?

- This study provides an example of a successful program to increase the medication adherence of bipolar patients. Creating conditions that foster consistency and self-efficacy can improve patient adherence to therapy and patient quality of life, as well as help prevent relapse and hospitalization. The findings may also be useful for other psychiatric patients.

clude low motivation,^[11] reluctance to take medication,^[12] and weak self-efficacy.^[13] Individuals who believe that they have self-control over their health have higher adherence rates.^[14] Forgetfulness and lack of routines have been reported to be among the most important causes of non-adherence in bipolar patients.^[15]

The most positive evidence related to improved treatment adherence in bipolar patients has been reported in studies in which drug therapy and psychosocial treatments were applied together.^[16,17] Cognitive-behavioral therapy is long-lasting and can prevent relapses and increase adherence to drug therapy. Similarly, psychoeducation has become a standard practice that can improve medication adherence.^[18] In addition, behavioral methods, such as motivational interviews that identify patient beliefs that prevent them from complying with the treatment, or techniques such as a patient marking the days when medication is to be taken on a chart have proven useful.^[19] The common point of these approaches is that they use a combination of tools to foster the patient's ability to manage the disease on their own, which provides a measure of control that helps to support well-being and successful treatment.^[5,6,20]

Behavior change is typically necessary to achieve optimal results among patients with bipolar disorder. Motivational interviewing, a form of directed counseling, can provide the necessary stimulus and reinforcement to promote change.^[21] The technique can be an effective means of psychotherapeutic intervention and used as an evidence-based approach to develop behavioral health regimens and medication adherence.^[22] As a patient-centered counseling style, motivational interviewing can help individuals discover and resolve ambivalence.^[23] This technique can be especially useful with reluctant or insecure patients who have false beliefs and attitudes about the need for medication. Motivational interviewing uses behavioral analysis and other methods to examine and understand the advantages and disadvantages of their behaviors.^[23,24]

In addition to motivation, forgetfulness and individual habits are other factors that can affect the adoption of behavior

change. The use of electronic reminders and follow-up systems has been shown to increase adherence and support behavior change.^[25-28] Reminders can be very effective in cases of forgetfulness and unintentional resistance. Studies have reported that education, counseling, and follow-up by telephone reduced recurrent hospitalizations, shortened the length of hospital stay, and promoted compliance with appointments.^[29-31]

A variety of interventions to encourage adherence have demonstrated some success particularly when used in a combination suited to the individual patient.^[25] There are several reports in the literature noting that a multifaceted approach is likely to be more successful than psychoeducation alone.^[32-34] Based on this foundation, this study was designed to examine a layered intervention program developed for bipolar patients that included motivational interviewing and support with telepsychiatric follow-up to support medication adherence.

Materials and Method

Ethical Considerations

Approval was obtained from the ethics committee of Cumhuriyet University on April 17, 2015 (no: 2015-04/17). The patients participating in the study were informed about the research and provided written consent.

Study Design

This was a randomized controlled trial with pre and post testing of an experimental and a control group. The population consisted of 92 patients diagnosed with bipolar disorder who had been discharged from a public hospital in the previous year and registered with a community mental health center. Sixty patients who met the inclusion criteria established for the study and agreed to participate were enrolled. The inclusion criteria were a bipolar diagnosis according to the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition, educational status of at least primary school graduate, between the ages of 18-65 years, score of 1-7 on the Medication Adherence Rating Scale (MARS), residence in the city center, and having a mobile phone. The exclusion criteria were an Axis II diagnosis, substance addiction, visual impairment, physical illness, or perception and communication problems. In all, 30 patients were assigned to the experimental group and 30 in the control group by drawing lots. Two of the patients in the experimental group and 4 of the patients in the control group were subsequently excluded due to hospitalization, and the study was completed with 28 patients in the experimental group and 26 patients in the control group.

Research Hypotheses

H1. Medication adherence would be higher 6 months after participation in the motivational interview-based medication adherence program and telepsychiatric follow-up compared with prior adherence among bipolar patients.

H2. Medication adherence would be higher 3 months after participation in the motivational interview-based medication adherence program and telepsychiatric follow-up compared with prior adherence among bipolar patients.

H3. Medication adherence would be higher at 3 months among those who participated in the motivational interview-based medication adherence program and telepsychiatric follow-up compared with those who did not.

H4. Medication adherence would be higher at 6 months among those who participated in the motivational interview-based medication adherence program and telepsychiatric follow-up compared with those who did not.

Data Collection Tools

The Morisky Medication Adherence Scale (MMAS), the MARS, and an information form were used to collect the study data.

Morisky Medication Adherence Scale

The MMAS is a validated assessment tool originally developed by Morisky. A validity study of a Turkish version was performed by Yılmaz.^[35] The version of the scale used in this study includes 4 items answered with a yes/no response, and rates the patient's medication adherence as good (0 points), moderate (1-2 points), or poor (3-4 points). The original Cronbach alpha coefficient of the scale was 0.63.^[35] Patients who answered "yes" to all of the questions were evaluated as adherent, and patients who answered "no" to at least 1 question were considered non-adherent. In this study, the Cronbach alpha coefficient of the scale was 0.72.

Medication Adherence Rating Scale

The MARS was created by Thompson et al. using a combination of the MMAS and the Drug Attitude Inventory with the aim of evaluating treatment adherence behaviors and patient attitudes for a 1-week period. The scale consists of 10 questions answered with a yes/no response. A low score indicates poor adherence.^[36] A validity and reliability study of a Turkish version of the scale was performed by Koç.^[36] The authors found that a score of 1-7 indicated poor adherence to treatment, while a score of 8-10 suggested high adherence. The test-retest reliability Cronbach alpha coefficient of the Turkish MARS was 0.92. In this study, the Cronbach alpha coefficient of the scale was 0.83.

Information Form

The personal information form consisted of 3 sections. In the first part, 14 questions solicited demographic characteristics, including age, gender, marital status, educational status, occupation, employment status, economic status, health insurance status, physical illness history, family type and cohabitants, and history of suicide attempt. The second part consisted of 8 questions about disease characteristics, and the third part had 8 questions about medications.

Data Collection and Program Implementation

Patients who met the inclusion criteria of the study were assigned to the experimental and control groups using the randomization method (coin toss). The information form, MMAS, and MARS were administered to both groups. The motivational interview-based medication adherence improvement program (MIMAP) administered consisted of motivational interviews conducted in 6 sessions held twice a week, each lasting 40-45 minutes. The final session included medication training. After the program, SMS reminders to take medication were sent to the experimental group participants for 3 months. The assessment tests were readministered to the experimental and control groups at 3 and 6 months (Fig. 1).

Medication Adherence Improvement Program

The MIMAP used in this study was based on established motivational interviewing methods. Individual interviews were conducted, medication training was provided, and SMS reminders were sent as follow-up. The aim of the program was to analyze the individual's ambivalence towards medication use, to strengthen their self-management and adherence to drug treatment, to eliminate lack of knowledge about medications, and to support behavior change. The MIMAP consisted of 6 sessions, comprising a total of 240-270 minutes. The first

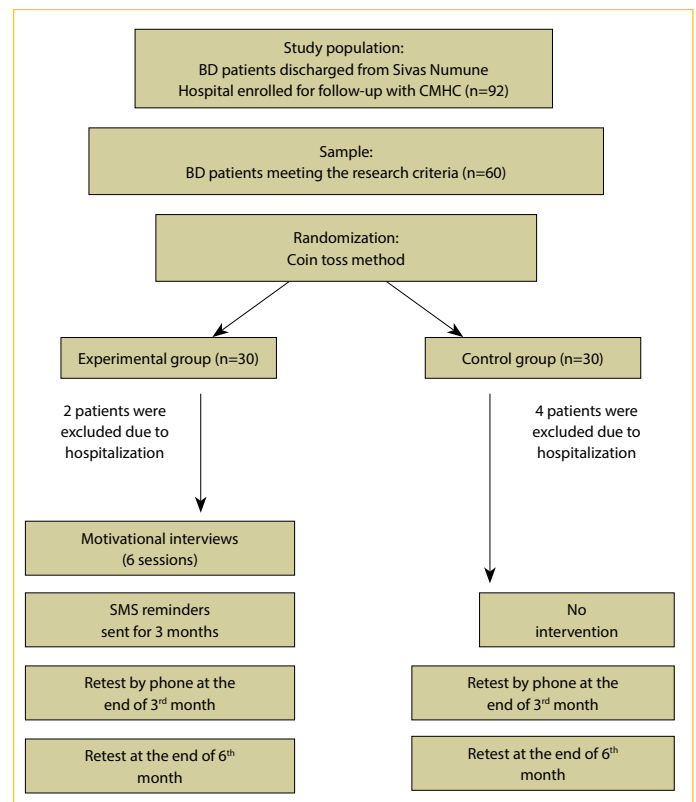


Figure 1. The systemic immune inflammatory level by group. Group 1: serum C-reactive protein (CRP) results <3.0 mg/L, Group 2: serum CRP results between 3.0-9.0 mg/L. SII: System immune-inflammatory index; SII = neutrophil×platelet / lymphocyte.

3 sessions were designed to identify and resolve points of ambivalence and create motivation for change, while the fourth and fifth sessions focused on strengthening commitment to change, and the final session was centered on medication training. After completing the program, SMS reminders to take medication were sent to the patients for 3 months. Evaluations were conducted at the third and sixth months.

Statistical Analysis

The data were evaluated using IBM SPSS Statistics for Windows, Version 22.0 software (IBM Corp., Armonk, NY, USA). The Kolmogorov-Smirnov test was used to examine the data distribution, and a test of significance of the difference between 2 means, analysis of variance in repeated measurements, the Friedman test, the Wilcoxon test, the Mann-Whitney U test, chi-squared test, and correlation analysis were used to further evaluate data. The level of error was set at 0.05.

Results

The experimental and control groups had similar characteristics in terms of age, gender, education, employment, marital status, economic status, family structure, and history of suicide attempt ($p > 0.05$) (Table 1).

At baseline, the MMAS scores indicated that 25% of the experimental group and 34.6% of the control group had moderate medication adherence, and the difference between groups was statistically insignificant ($p > 0.05$). In all, 75% of the experimental group and 65.4% of the control group were non-adherent to drug therapy, and the difference was statistically insignificant ($p > 0.05$) (Table 2).

Comparison of the mean MMAS score of the experimental group recorded before the program, at the third month, and at the sixth month yielded a significant difference ($p < 0.05$). When the measurements were compared in pairs, the differences between the mean baseline score and third-month MMAS score, and the baseline and sixth-month MMAS score were significant ($X^2 = 48.84$; $p = 0.001$), while no statistically significant difference was seen between the mean third- and sixth-month MMAS scores ($p > 0.05$). The H1 and H2 hypotheses were supported with findings that medication adherence was higher following participation in MIMAP with telepsychiatric follow-up. The difference was insignificant when the mean MMAS scores of the control group measured before the program, at the third, and the sixth month were compared ($p > 0.05$) (Table 3).

As seen in Table 3, when the baseline MMAS scores of the experimental and control groups were compared, the difference between the groups was insignificant ($p > 0.05$), while the difference at the third and sixth months was significant ($p < 0.05$). There was greater medication adherence among the patients who had participated in the MIMAP and telepsychiatric follow-up than in the controls, confirming the H3 hypothesis. Medication adherence of the experimental group patients

Table 1. Comparison of individual characteristics of experimental and control groups

Characteristics	Experimental		Control		Test/p
	N	%	N	%	
Mean age (years)	42.42±10.05		42.11±10.17		t=0.11 p=0.910
Gender					
Female	13	46.4	12	46.2	$X^2=0.00$ p=0.984
Male	15	53.6	14	53.8	
Marital status					
Married	19	67.9	17	65.4	$X^2=1.03$ p=0.595
Single	2	7.1	4	15.4	
Divorced	7	25	5	19.2	
Education level					
Primary school	19	67.9	16	61.6	$X^2=2.27$ p=0.517
High school	6	21.4	5	19.2	
University/master's	3	10.7	5	19.2	
Employment status					
Employed	11	39.3	10	38.5	$X^2=0.00$ p=0.951
Not employed	17	60.7	16	61.5	
Economic status					
In-come < expenses	9	32.1	7	26.9	$X^2=2.12$ p=0.345
Income = expenses	11	39.3	15	57.7	
Income > expenses	8	28.6	4	15.4	
Family type					
Nuclear	23	82.1	23	88.5	$X^2=0.42$ p=0.514
Extended	5	17.9	3	11.5	
Suicide attempt					
Yes	9	32.1	5	19.2	$X^2=1.17$ p=0.279
No	19	67.9	21	80.8	
Total	28	100.0	26	100.0	

Table 2. Comparison of experimental and control group adherence according to the Morisky Medication Adherence Scale prior to the study program

Adherence rates	Experiment		Control		Test/p
	N	%	N	%	
Moderate	7	25.0	9	34.6	$X^2=0.59$ p=0.439
Non-adherent	21	75.0	17	65.4	
Total	28	100.0	26	100.0	

was also observed to be greater at 6 months than that of the controls, validating the H4 hypothesis.

Table 4 shows the comparison of the mean MARS scores measured before the program, at the third month, and at the sixth month and illustrates a significant difference ($p < 0.05$). When the measurements were compared in pairs, the difference between the mean baseline and third-month MARS scores, the

Table 3. Comparison of mean Morisky Medication Adherence Scale scores of the experiment and control groups at baseline, 3 months, and 6 months

	Experimental	Control	Test/p
	Mean±SD	Mean±SD	
Before program	2.96±0.69	2.96±0.91	t=0.01 p=0.990
3 months	0.46±0.83	2.84±0.83	t=10.46 p=0.001*
6 months	0.14±0.44	3.15±1.00	t=14.36 p=0.001*
Test/p	$\chi^2=48.84$ p=0.001*	$\chi^2=4.29$ p=0.117	

Table 4. Comparison of mean experimental and control group Medication Adherence Rating Scale scores at baseline, 3 months, and 6 months

	Experimental	Control	Test/p
	Mean±SD	Mean±SD	
Before program	4.17±1.78	3.65±1.83	t=1.06 p=0.292
3 months	7.46±1.95	3.61±1.83	t=7.45 p=0.001*
6 months p=0.001*	8.57±1.68	3.80±1.81	t=10.00
Test/p	$\chi^2=48.59$ p=0.001*	$\chi^2=0.47$ p=0.789	

preliminary and sixth-month scores, and the third- and sixth-month scores were significant ($\chi^2=48.59$; $p=0.001$). There was a significant difference between the groups in terms of the mean scores of MARS measured at the third and sixth month ($p<0.05$). The mean MARS scores of the control group did not demonstrate a significant difference over time ($p>0.05$). The study hypotheses were confirmed.

Discussion

In this study, the initial medication non-adherence rate of the study patients according to the MMAS scores was 76.7% in the experimental group and 60% in the control group. The results for participants in the MIMAP revealed that the non-adherence rate in the experimental group decreased by 73.4% at the third month and by 66.7% at the sixth month. The MMAS score in the control group did not change significantly at 3 months, and increased by 13.1% at 6 months.

The MARS evaluation of non-adherence in the experimental group decreased by 33.3% at the third month, and by 86.7% at the sixth month. In the control group, the MARS score increased by 4.2% at the third month and by 13.05% at the sixth month.

It has been reported that as many as 70% of bipolar patients will discontinue their medication, although non-adherence rates varied considerably between studies, partly due to the heterogeneity of patient populations.^[2,3,37] Most often, discontinuation has been observed in the first year.^[1,38] Levin et al.^[39] reported that in a 3-month follow-up study of 86 bipolar patients with poor adherence, the rate of non-adherence was 40.2% in the previous week and 42.8% in the previous month. The adherence rate data in the literature are consistent with our study findings.

Although many studies have used and assessed motivational interviewing techniques,^[40-43] a review of the literature yielded no study using motivational interviewing and SMS reminders to increase drug adherence in bipolar patients. Related research includes 2 uncontrolled studies and 1 controlled study designed to improve medication adherence in bipolar patients. One of these studies used motivational interviewing in a 3-week intervention with 15 patients. The first session was conducted face-to-face and 2 subsequent sessions were conducted by phone. The results revealed a significant increase in medication adherence, self-efficacy, and motivation for change.^[40] In a quasi-experimental study of 21 bipolar patients >50 years of age, it was found that a 12-week training course to improve medication adherence skills that included education, motivation training, and medication and symptom management resulted in a 15% decrease in the non-adherence rate of patients and a 31% decrease in difficulty with medication management.^[41] The results of a multifaceted randomized controlled experimental study that included motivational interviewing and psychoeducation to increase medication adherence in bipolar patients also indicated that adherence increased by 35% based on MMAS scores, as well as improvement in other measures, including symptoms, quality of life, and patient beliefs, intentions, and self-efficacy in a 6-month follow-up.^[42] Jones et al.^[43] reported that patients in a motivational interview group showed a significant reduction in impulsivity and substance use, as well as significant improvement in treatment adherence and mood.

Our findings are consistent with previous studies showing that motivational interviewing can improve treatment adherence in bipolar patients. Continuity is required for successful treatment of bipolar disorder.^[7] Bipolar patients typically adhere to use of long-term mood stabilizers for an average of 5 months.^[44] Reminders can be useful in cases of unintentional non-adherence due to forgetfulness or lack of a consistent medication routine. Studies have reported that education, counseling, and follow-up by telephone can reduce recurrent hospitalizations, shorten the length of hospital stay, and improve compliance with appointments.^[29-31] In this study, the SMS reminders sent to patients every day for 3 months proved an effective tool in maintaining drug adherence. The reminders to use their medications may have helped to address forgetfulness and organizational difficulties, and contributed to a belief that they were supported yet capable of managing their condition. This finding demonstrates the value of home follow-up of bipolar patients.

For some patients, adherence to drug therapy is difficult for more complex reasons, as it often requires significant changes in thoughts and behavior. Although some may accept the benefits of medication, ambivalence may lead to decreased treatment effectiveness and negative health outcomes.^[22] It has been observed that poor adherence is frequently associated with poor motivation, reluctance, and beliefs that drugs are unnecessary as well as a high level of anxiety about the side effects of medication.^[11,45] The attitudes and thoughts of patients about bipolar disorder are a primary reason for non-adherence.^[7] Previous research noted the following factors inhibiting regular medication use: disbelief that the condition will improve with drug use (32.4%), experiencing side effects (27.4%), belief that they have been healed (9.8%), forgetting to take medication (7.8%), feeling exhausted due to long-term drug use (5.9%), belief that they are not sick (5.9%), and other reasons (10.8%).^[4] Motivational interviewing is an evidence-based psychotherapeutic intervention that can be used to increase patients' adherence to behavioral health regimens and treatment.^[46-48] The results of this study demonstrated that the level of medication adherence of the patients in the experimental group was significantly greater than that of the patients in the control group. The motivational interviews conducted to discuss sources of ambivalence, negative beliefs, and behaviors provided support for initiating and sustaining healthy changes. Self-awareness and self-management tools provided a foundation for behavior change and greater medication adherence. Re-evaluation of medication use in follow-ups may have also contributed to increases in medication adherence.^[2,3,29-31,37,46]

Conclusion

The MIMAP with telepsychiatric follow-up used in this study demonstrated successful results. Medication adherence increased significantly in the experimental group and was maintained over time. These findings are valuable as an illustration of the benefit of this type of program for bipolar patients, and potentially for other patients. Additional randomized controlled studies are recommended.

Conflict of interest: There are no relevant conflicts of interest to disclose.

Peer-review: Externally peer-reviewed.

Authorship contributions: Concept – Z.G.G., M.K.; Design – Z.G.G., M.K.; Supervision – M.K.; Data collection &/or processing – Z.G.G.; Analysis and/or interpretation – Z.G.G., M.K.; Literature search – Z.G.G.; Writing – Z.G.G., M.K.; Critical review – Z.G.G., M.K.;

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