

Predictors of Medication Adherence among Patients with Bipolar I Disorder

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Abstract

The present study aimed to determine predictors of medication adherence among patients diagnosed with Bipolar I Disorder (BP-I). Another aim was to estimate differences with different marital status in perceived social support, internalized stigmatization and medication adherence. Correlational research design was used and a sample of 103 participants was gathered using purposive sampling method. Data was collected by administering Multidimensional Scale of Perceived Social Support (MSPSS), Internalized Stigma of Mental Illness (ISMI), and General Medication Adherence Scale (GMAS). Results illustrated perceived social support ($R^2 = .46$, $F(3, 99) = 28.52$, $p < 0.001$) and internalized stigmatization $R^2 = .49$, $F(8, 94) = 11.40$, $p < 0.001$) to be significant predictors of medication adherence. Furthermore, it was found that married individuals with bipolar I disorder received more support [$F(1, 101) = 4.08$, $p = .04$] and were more adherent to medication [$F(1, 101) = 6.35$, $p = .01$] as compared to single individuals with bipolar I disorder. However, no significant difference was found between married and single patients in their experience of internalized stigmatization. Present study highlights the need for awareness campaign where individuals are informed regarding the importance of their support and also the need for educational workshops for skill building in patients with Bipolar I disorder.

Keywords: Awareness Campaign, Bipolar I Disorder, Internalized Stigmatization, Medication Adherence, Perceived Social Support

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Introduction

Bipolar disorder (BP) is a psychiatric condition which is considered to be the leading cause of disability worldwide among mood disorders (Benedetti et al., 2020). In BP disorder, individual experiences fluctuations in his mood, behavior and thought patterns. Bipolar disorder has two main subtypes; Bipolar I Disorder (BP-I) and Bipolar II disorder (BP-II). In BP-I, patient

experiences manic, hypomanic or depressive episodes. Manic episodes incorporate elated, expansive, irritable mood, also there is highly energized activity level, which is inconsistent with patients' normal functionality. Hypomanic episodes also have same features like manic episodes but its intensity and duration is low. Depressive episodes on the other hand are periods of low, sad mood where patient loses interest in all activities they previously use to find interesting (APA, 2022; Carvalho et al., 2020). Bipolar I Disorder (BP-I) is more severe and disabling in nature as compared to Bipolar II disorder (Altamura et al., 2018; APA, 2022).

Considering the severity and disabling nature of BP-I, being diagnosed with is a traumatic experience and patients look out for support from their loved ones. Social support is primarily the extent of help, care and backing that individual gets from society, his sense of connection, acknowledgement and

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understanding in order to get his basic needs fulfilled by interacting with them and to undo his feelings of loneliness (Emerson et al., 2020). Perceived social support on those lines is individual's personal perception of whether the social lent by people meets the criteria of required help or not (Ahmed & Gemeay, 2017). Patients with BP benefit from social support. As per recent research, provision of social support aids in alleviating depression, boosting patient's recovery period and also his commitment and response towards psychiatric treatment (Adnan et al., 2021). Furthermore, BP patients on lithium regimen receiving high support report less episodes of the disorder. Also, if they experience an episode of mania they are likely to recover relatively quickly than the patients who have low social support (McIntyre et al., 2022). Research has deemed perceived social support as integral component when dealing with patients with Bipolar disorder. Social support boosts up their confidence and increases their motivation towards recovery by positively influencing their adherence towards medication (Hassan & Zaki, 2018). It also helps in reducing their internalized stigma and improves their quality of life (Hsiao et al., 2017).

Internalized stigmatization is a transformative process which can be broken down into a stepwise procedure that incorporates, a) individual getting in contact with the stereotypes formed by society, b) then accepting them, c) followed by application of those stereotypes to oneself, d) that as a consequence leads to decreased self-esteem (Corrigan et al., 2011). One third of the patients diagnosed with BP-I experience high level of internalized stigmatization and half of the patients experience moderate level of stigmatization. Internalized stigmatization is more prevalent in female patients (Tesfaye et al., 2020). Patients with high internalized stigmatization are less adherent in following

their medicinal regime (Tesfaye et al., 2020). Putting off their medicines makes BP patients more susceptible to recurrent episodes of illness accompanied with suicidal thoughts, depressive mood or elated behaviors. Hence, increasing family members' and societal responsibility to take care of the individual consequently increasing burden of disease.

Even though patients are knowledgeable regarding the aftermaths of it, still more than half of the patients with BP show medication non-adherence (Jawad et al., 2018). Non-adherence can be in several forms like not using their prescribed medication, using non-prescribed drugs and not attending appointments according to schedule (Kvarnström et al., 2018). Medication adherence is the term used to define the extent to which a client follows the instructions provided by a clinical professional regarding prescribed medicinal intake i.e., medicine's time, quantity of dose, intervals of dosage. (Gast & Mathes, 2019). Providing a client with an insight into their illness, maintaining a proper medicinal schedule, keeping note of timing have been proved effective in proper implementation of all treatment instructions by clinicians (Jimmy & Jose, 2011). Furthermore, positive familial attitude and understanding towards their illness also encourages continuation of treatment (Chakrabarti, 2016) and Quality of Life (QoL) (De Maria et al., 2020).

Individuals diagnosed with Bipolar disorder, face difficulties not only in their personal life but familial life as well. As per research, 3.2% of married BP-I individual complained of having strained relationships with their spouses, on the pretext that their view on important familial matters is not sorted and that they are not provided appropriate medical facilities during their sick days. Wives perceived to have poor interpersonal relationships as compared to husbands. Furthermore, Bipolar disorder was declared to be a predictive factor of interpersonal

relationships among married couples (Wadood et al., 2021). Further, Pakistan's culture specific studies identified that lack of knowledge regarding mental health and its rehabilitation process instead of their gender, marital / socio-economic status is a major reason of individuals not seeking psychiatric or psychological services and rather prioritizing spiritual or sociocultural-religious interventions. If there is more awareness concerning mental conditions, their fear concerning stigma will be catered and they will more confidently and openly seek treatment (Ahmad & Koncsol, 2022; Shafiq, 2020).

Current study follows Engel's biopsychosocial model (Engel, 1997) which proposes that individual's biological (medication), psychological (internalized stigmatization) and social (perceived social support) factors collectively influence the progression and development of an illness as well the strategies to deal with it.

Rationale of the Study

Medication is the first line of treatment for BPI. Lack of adherence towards medication is a significant issue that is faced by clinicians. Current study aims to determine the predictors of medication adherence of patients with BP-I. This will help clinicians in formulating their intervention in a way to promotes medication adherence and improve betterment in patient's health and Quality of Life (QoL) can be assured.

Objectives

- To determine predictors of medication adherence among patients diagnosed with Bipolar I Disorder (BP-I).
- To estimate differences with different marital status in Perceived social support, internalized stigmatization and medication adherence among patients diagnosed with Bipolar I Disorder (BP-I).

Hypotheses

- Medication adherence is positively predicted by Perceived social support among patients diagnosed with Bipolar I Disorder (BP-I).
- Medication adherence is negatively predicted by internalized stigmatization among patients diagnosed with Bipolar I Disorder (BP-I).
- Married patients with Bipolar I Disorder (BP-I) perceive having more social support and less internalized stigmatization leading to higher level of medication adherence
- Single patients with Bipolar I Disorder perceive having low social support and high internalized stigmatization leading to low or no medication adherence.

Method

Research Design

Correlational research design was used for the present research.

Participants' Characteristics

Sample consisted of 103 participants i.e., 28 (27.2%) male and 75 (72.8%) female patients recruited from different hospitals in Pakistan. Mean age of the total sample was 37 years (Male= 34 years and Females = 37 years). Sixty (58.3%) participants were single, whereas 43 (41.7%) were married. Mean years of education of the participants was 11 years. Mean duration of time since BP- 1 has been diagnosed was 10 years. Mean duration of time since medication had been started was 6 years. Mean number of daily intake medicines was 4 for the sample.

Inclusion Criteria

- i) Patients diagnosed with BP-I disorder according to DSM-5-TR criteria,
- ii) Patients who were in their active phase but were able to attend the outpatient treatment and could

- provide the researcher with their informed consent.
- iii) Patients who had been taking medication for at least 1 month for BP-I disorder.

Exclusion Criteria

- i) Hospitalized patients with BP-I or any psychiatric disorders
- ii) Patients with other types of bipolar disorders and patients diagnosed with BP-I along with a serious comorbid medical condition like heart disease, cancer, HIV, TB or comorbid psychiatric conditions.

Measures

A self-designed questionnaire was used to obtain information regarding the participants' demographic characteristics. Three standardized scales were used to collect data i.e., the Multidimensional Scale of Perceived Social Support (MSPSS), The Internalized Stigma of Mental Illness (ISMI) scale, and the General Medication Adherence Scale (GMAS). All the scales were reported to have a high-reliability coefficient (ranging from .84 to .92) (Akhtar et al., 2010; Chang et al., 2014; Naqvi et al., 2018). Details of the scales are given below:

The Multidimensional Scale of Perceived Social Support (MSPSS) (Urdu Version)

The Multidimensional Scale of Perceived Social Support is a 12-item questionnaire that measures an individual's perception of social support received (Zimet et al., 1988). It had 3 subscales, i.e., support from family, friends, and significant others. The scale has high reliability i.e., .85 (Dahlem et al., 1991). Urdu translated version of MSPSS (Akhtar et al., 2010) was used. The translated MSPSS has a good internal consistency of 0.92. For the current study, the Cronbach alpha coefficient for the scale is estimated as 0.87 (Table 1).

The Internalized Stigma of Mental Illness (ISMI) Scale (Urdu Version)

It consists of 29 items, which determine the level of stigma patients with psychiatric illness have internalized (Boyd et al., 2013). It had five subscales i.e., Alienation, Stereotype endorsement, Perceived discrimination, social withdrawal, and stigma resistance. Its internal consistency ranged from .80 to .92 for all subscales (Chang et al., 2014). Urdu translated version was used. Cronbach alpha for the whole scale for the current study is 0.88. Cronbach alpha for the subscales of ISMI for the current study is presented in Table 1.

General Medication Adherence Scale (GMAS) (Urdu Version)

This is an 11-item self-administered questionnaire in the Urdu language that measured patients' adherence to medication (Naqvi et al., 2018). It has three domains, e.g., Non-adherence due to Patient Behavior (PBNA), Comorbidity and Pill Burden related non-Adherence (ADPB), and, Cost-Related Nonadherence (CRNA). The scale had Cronbach's alpha value of 0.84 and its Content Validity Index (CVI) was reported as 0.8. Cronbach alpha coefficient for the current study is estimated as 0.75 (Table 1).

Procedure

Institutional Review Board of Forman Christian College Lahore (IRB) approved the study after review (Letter No: IRB-221/06-2020). Permission to use psychological tools was sought from the concerned authors. Further, permission from the Medical Superintendents and Heads of Psychiatry Departments of different hospitals of Lahore (e.g., Units of Punjab Institute of Mental Health as well as Departments of Psychiatry, General Hospital, Jinnah Hospital, and Services Hospital, Lahore) to collect data was taken. Participants were briefed through informed consent about the nature and purpose of the study before collecting data. They were also informed about their right to

withdraw from participating in the study. The confidentiality and privacy of the collected information was maintained. American Psychological Association ethical research guidelines were followed throughout the study.

Pilot study was carried out to determine the feasibility of the research before conducting the main research. No major changes had to be made after pilot study. Sample size for data collection was determined by reviewing prior literature's sample size and using *g* power analysis. The outcome of the analysis was that with 90% power, a sample of 88 patients was enough to estimate the medium effect size (i.e., 0.3). Using purposive sampling, a sample of 103 out-patients (male

n=28 and female *n*=75) diagnosed with Bipolar 1 Disorder (BP-I) was taken from various hospitals in Lahore, Pakistan mentioned above.

Results

Descriptive and inferential analyses were carried out to draw results. The statistical analysis of hierarchical linear regression was carried out to examine the predictors of medication adherence. To study marital differences in perceived social support, internalized stigmatization, and medication adherence, Analysis of Variance (ANOVA) was performed. Data of the current study was analyzed using the Statistical Package for Social Sciences, version 21 (SPSS-v21).

Table 1

Psychometric Properties of Variables in the Sample (N=103)

	Variables	<i>k</i>	<i>M</i>	<i>SD</i>	α	Skewness	Kurtosis
	MSPSS	12	4.51	1.44	.87	.45	-.61
	Significant others	4	4.62	2.33	.96	-.42	-1.49
Subscales of MSPSS	Family	4	4.36	1.91	.91	-.31	-1.12
	Friends	4	4.57	1.92	.94	-.46	-1.04
	ISMI	29	2.31	.51	.89	-.38	-.17
	Alienation	6	2.62	.75	.78	-.16	-.74
	Stereotype endorsement	7	1.91	.60	.73	.44	-.35
Subscales of ISMI	Discrimination experience	5	2.48	.80	.76	.85	.33
	Social withdrawal	6	2.46	.78	.83	.03	-.78
	Stigma resistance	5	2.11	.59	.55	.21	-.37
Subscales of GMAS	GMAS	11	23.85	6.09	.73	-.72	.36
	PBNA	5	9.71	3.76	.70	-.64	-.24
	ADPB	4	9.37	2.49	.53	-1.03	.58
	CRNA	2	4.78	1.59	.47	-1.04	-.06

Note: *k*= number of items, *M*= Mean, *SD*= Standard Deviation, α = Cronbach Alpha, ISMI= Internalized Stigma of Mental Illness, MSPSS= Multidimensional scale of Perceived social support, GMAS= General Medication Adherence Scale, PBNA= Non-adherence due to patient behavior, ADPB= Pill burden related non-adherence, CRNA= Cost-related Non-adherence

Table 1 demonstrates reliability analysis, means and standard distributions of the scales used in current study. Most scales show good reliability while few scales fall under the acceptable reliability range as evident by Cronbach alpha values. Similarly, the sample

was normally distributed as all values fall within the acceptable range of ± 1.96 . Pearson product-moment correlation analysis was carried out to examine the relationship between different variables.

Table 2

Hierarchical Linear Regression among Variables (N=103)

Predictors	Medication				Adherence			
	GMAS		PBNA		ADPB		CRNA	
	ΔR^2	<i>B</i>	ΔR^2	<i>B</i>	ΔR^2	<i>B</i>	ΔR^2	β
Model 1	.46**		.12**		.10*		.14**	
Sig. others		.41***		.35**		-.04		.20
Family		.44***		.11		.31**		.27
Friends		.11		-.24*		-.09		.05
Model 2	.49***		.15*		.16*		.23**	
Alienation		.03		-.05		-.03		.24
Stereotype endorsement		.15		-.09		.09		.09
Discriminative experience		-.15		.10		.12		-.11
Social withdrawal		-.05		.04		-.31*		.14
Stigma resistance		-.10		-.13		.09		-.26*

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Note: GMAS: General Medication Adherence Scale, PBNA: Non-adherence due to patient behavior, ADPB: Pill burden related non-adherence, CRNA: Cost-related Non-adherence

A hierarchical linear regression was run to determine the predictors of medication adherence. In the first model, social support and its subscales i.e., support from significant others, family and friends were added and the model came out to be significant ($R^2 = .46$, $F(3, 99) = 28.52$, $p < 0.001$). Subscales of significant others and family support made significant and strongest contribution to this

prediction. In block 2, Internalized stigma and its subscales (Alienation, Stereotype endorsement, Perceived discrimination, social withdrawal, and stigma resistance (Boyd et al., 2013), along with perceived social support and its subscales were added and model was determined to be significant predictor of medication adherence ($R^2 = .49$, $F(8, 94) = 11.40$, $p < 0.001$). Model did not

remain significant after excluding the effect of perceived social ($R^2 = .03$, $F(5, 94) = 1.07$, $p = .38$).

Predictors for Patient-Behavior Non Adherence (PBNA) scale were determined. In the first model, social support and its subscales were added, and the model came out to be significant ($R^2 = .12$, $F(3, 99) = 4.51$, $p < 0.001$). Subscales of friends and significant others support made significant and strongest contribution to this prediction. In block 2, Internalized stigma and its subscales were added and model was determined to be significant predictor of medication adherence ($R^2 = .15$, $F(8, 94) = 2.03$, $p < 0.05$). Model did not remain significant after excluding effect of perceived social support ($R^2 = .27$, $F(5, 94) = .59$, $p = .71$).

Predictors for Pill Burden Non-Adherence (ADPB) were determined. In the first model, social support and its subscales i.e., significant others, family, friends were added and the model came out to be significant ($R^2 = .10$, $F(3, 99) = 3.61$, $p < 0.05$). Subscales of family support made significant and strongest

contribution to this prediction. In block 2, Internalized stigma and its subscales along with perceived social support and its subscales were added and model was determined to be significant predictor of medication adherence ($R^2 = .16$, $F(8, 94) = 2.22$, $p < 0.05$). Subscales of social withdrawal made significant and strongest contribution to this prediction. Model did not remain significant after excluding effect of perceived social ($R^2 = .60$, $F(5, 94) = 1.35$, $p = .25$).

Predictors for Cost-related Non-adherence (CRNA) were determined. In the first model, social support and its subscales were added and the model came out to be significant ($R^2 = .14$, $F(3, 99) = 5.23$, $p < 0.01$). In block 2, Internalized stigma and its subscales along with perceived social support and its subscales were added and model was determined to be significant predictor of medication adherence ($R^2 = .23$, $F(8, 94) = 3.48$, $p < 0.01$). Subscales of stigma resistance made significant and strongest contribution to this prediction. Model did not remain significant after excluding effect of perceived social ($R^2 = .09$, $F(5, 94) = 2.24$, $p = .06$).

Table 3

One way Analysis of Variance (ANOVA) of Internalized Stigmatization, Perceived Social Support and Medication Adherence among Married and Single patients with Bipolar 1 Disorder (N=103)

Variable	Married (n=43)		Single (n=60)		F	p
	M	SD	M	SD		
ISMI	2.26	.52	2.34	.51	.54	.46
MPSS	4.85	1.38	4.28	1.44	4.08	.04*
GMAS	23.56	6.50	19.98	7.50	6.35	.01**

** $p < 0.01$, * $p < 0.05$

Note. M= Mean, SD = Standard deviation, ISMI= Internalized Stigma of Mental Health Illness, MSPSS= Multidimensional Scale of Perceived Social Support, GMAS= General Medication Adherence Scale

Table 3 shows One-way ANOVA results. The test was run to determine the differences in perceived social support, internalized stigmatization, and medication adherence

among married and single patients with bipolar disorder 1 (BP-1). Analysis revealed that married individuals with BP 1 received more support [$F(1, 101) = 4.08$, $p = .04$] and

were more adherent to medication [$F(1, 101) = 6.35, p = .01$] as compared to single individuals with bipolar disorder 1. Along with it, analysis also showed no significant difference existed in individuals' level of

internalization of stigma on basis of whether they were married or single [$F(1, 101) = .54, p = .46$].

Discussion

Present research studies predictors of medication adherence in patients diagnosed with BP 1 disorder. The current sample has about 1:4 ratio of male and female patients with BP I disorder (27 male and 73 females). Existing literature also reports an increase in the diagnosis of BP 1 disorder in female population (Cunningham et al., 2020; Dell'Oso et al., 2021). Moreover, female patients were found to be more educated than their male counterparts (11.6 vs. 9.36 years of education) though 2017 Pakistan Census report states that men had higher literacy rate (Pakistan Bureau of Statistics, 2017). The increase in the number of educated female patients may be due to their families having more insight about patients' need for treatment, hence approaching mental health facility. However, further research can fill this gap more appropriately. Marital status of majority of the current sample (i.e., 58%) was single which corroborates with prior research findings (Grover et al., 2017).

Prior to conducting prediction analysis, relationship between study variables was determined through Pearson Product moment correlation. As per results, medication adherence had a significantly positive relationship with perceived social support and significantly negative relationship with internalized stigmatization. Perceived social support and Internalized stigmatization both were found to predict medication adherence among patients with BP-I. Along with that perceived social support positively predicted adherence in terms of patient behavior, pill burden, and medication cost whereas Internalized stigmatization negatively predicted adherence in terms of patient

behavior, pill burden, and medication cost. Results are in correspondence to the 'coping with stress' model, which views social support as a defense mechanism against stressful situations (Faraji et al., 2015). According to it, when patients face any stressful situation like being diagnosed with a disorder, being labelled as dangerous or being rejected by the society they feel internally stigmatized. At that time if the support they receive from their family, friends and significant others is high, they use it as a defense mechanism against all these negativities in their lives. It helps them in successfully fighting off the thoughts leading to internalization of stigma. Along with that, it also boosts their spirit, promotes healthier lifestyle, by adhering to medication (Shahin et al., 2021). Social support further aids in decreasing patients' stressful and depressive thoughts regarding their present decline in quality of life. This helps to increase their psychological and immunological functioning and also facilitates accessing health care with the help of their supportive family or friends (Hassan & Zaki, 2018; Shahin et al., 2021). Current results are in line with the previous research that determines perceived social support as a significant predictor of medication adherence. This is because positive support builds confidence and hope in patients. They don't feel themselves as a burden on their loved ones. They are more aware of the need of taking medication and of the social consequences of not taking it, hence, develop their positive attitude towards medication (Baloush-Kleinman et al., 2011). An additional benefit of social support is that it is reported to be effective in reducing the chances of relapse in

bipolar disorder (El-Azzab & Ali, 2021). Prior research supports the claim that internalized stigmatization negatively predict medication adherence. As when individuals perceive experiencing increased discrimination from society, they become more socially withdrawn, are more likely to alienate themselves, hence more prone towards internalizing stigma regarding their mental health, which results in increased non adherence of medication (Korkmaz & Küçük, 2016). It also results in them having regression periods more often i.e., they relapse and experience increased depressive episodes. Functionality of these patients is also more impaired as compared to those without internalized stigma (Feldhaus et al., 2019; Üstundag & Kesebir, 2013).

Perceived social support for the married participants in the study was higher and their adherence to medication was better compared to single individuals. The results are in agreement with prior studies which concluded that married individuals have strong social support from their significant others and family, which aids in their medication adherence leading to have improved mental condition and quality of relationship (Feder et al., 2019; Harandi et al., 2017; Vaingankar et al., 2020). In addition to it, results concluded that married and single individuals with Bipolar disorder did not differ on their level of internalization of stigma which is in correspondence to literature. As according to it, in Pakistan a person's internalization of stigmatization is not dependent on his gender or marital status but rather on level of knowledge he has concerning to mental health and its care (Ahmad & Koncsol, 2022). It is due to person's lack of knowledge which add to the extremity of stigma, that they prefer spiritual/ sociocultural explanations and treatments to their presenting symptoms rather than seeking mental health care (Shafiq, 2020). Therefore, it is the need of hour to spread

awareness regarding mental health concerns in order to fight the stigma attached to it (Ahmad & Koncsol, 2022).

Conclusion

Present study determined perceived social support to be a positive and significant predictor of medication adherence and its subscales of Non-adherence due to patient behavior; Pill burden related non-adherence and Cost-related Non-adherence among patients with BP-I. Internalized stigmatization was found to be a negative and significant predictor of medication adherence and its subscales of Non-adherence due to patient behavior; Pill burden related non-adherence and Cost-related Non-adherence among patients with BP-I.

Furthermore, using ANOVA analysis it was found that married individuals with BP-I disorder received more support and were more adherent to medication as compared to single individuals with BP-I. Along with it, analysis also showed no significant difference existed in individuals' level of internalization of stigma on the basis of their marital status.

Contribution of Authors

Rameen Babar: Conceptualization, Methodology, Investigation, Data Curation, Formal Analysis, Writing – Original Draft
Shaista Jabeen: Methodology, Writing - Reviewing & Editing, Supervision

Conflict of Interest

There is no conflict of interest declared by authors.

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Data Availability Statement

The datasets of the current study are not available publicly due to ethical reasons but are available from the corresponding author [R.B.] upon the reasonable request.

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