

# The effect of insight, loneliness, and hope levels on medication adherence in patients with schizophrenia

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## Abstract

**Purpose:** It is important to investigate the negative factors affecting medication compliance to continue the treatment of schizophrenia.

**Design and Methods:** In this descriptive and analytical study, the effects of insight, loneliness, and hope levels on medication adherence in 202 patients with schizophrenia were studied.

**Findings:** The correlation was positive between medication adherence and insight, negative between medication adherence and loneliness, and no correlation between medication adherence and hope. A 1-point increase in insight scores increased medication adherence 1.226 times and a 1-point increase in loneliness scores decreased medication adherence 0.946 times. Medication adherence was 0.499 times lower in nonsmokers compared to smokers.

**Practice Implications:** Further studies on patients with schizophrenia should be conducted to evaluate factors affecting medication adherence and preventing smoking in schizophrenia.

## KEYWORDS

hope, insight, loneliness, medication adherence, schizophrenia

## 1 | INTRODUCTION

Treatment adherence is critical in the psychiatric rehabilitation of patients with schizophrenia. Non-adherence to treatment is manifested in many aspects including not using the prescribed medication, irregular use of medication, use of nonprescribed medication, missed appointments, and failure to attend follow-up visits (Dikeç & Kutlu, 2015). It receives the attention that in studies conducted half a century ago, 45% of patients with schizophrenia did not take their medications as they were instructed (Parkers et al., 1962; Renton et al., 1963) and the level of nonadherence was at a similar level to its current levels (Dufort & Zipursky, 2019; Hsieh et al., 2019; Settem et al., 2019). This means that adherence has not been improved despite all research efforts, interventions for adherence, development of new drugs, and increasing insight into adherence behavior over the last 50 years. Thus, it is necessary to investigate the issue from different aspects. Nonadherence is commonly observed, leading

to relapse, repeated hospitalizations, disease chronicity, and increased burden on the health system (McCann et al., 2009).

Among others, an important determiner of medication adherence is insight. Impaired disease insight is one of the major drivers of medication nonadherence contributing to adverse clinical outcomes. Indeed, there is a strong link between impaired insight and medication nonadherence (J. Kim et al., 2020). Uslu and Buldukoğlu (2018) reported that 19.6% of schizophrenia patients stopped taking their medication because they did not think that they had a disorder and 21.7% of them did so because they thought that they had already recovered. Lack of insight can be considered a core symptom of schizophrenia. The concept of insight is considered an essential contributor to treatment, improving long-term medication adherence and helping achieve a favorable prognosis. Although increased insight in schizophrenia acts favorably on disease course, symptom management, and contribution to treatment, it has unfavorable effects on self-stigma, self-esteem, quality of life, and hope (Serafini et al., 2011; Vrbova et al., 2017).

Another factor contributing to treatment adherence is the level of hope. In patients with schizophrenia, hope is a factor that initiates and maintains the healing process. Hope is also an important coping mechanism that facilitates striving against the disease and improves insight and adherence to treatment. Kavak and Yılmaz (2018) found out that the hope level was low in schizophrenia patients. H. Kim et al. (2018) found that hope was disadvantageously affected in psychiatric disorders and that the level of hope was low in schizophrenia patients. The concept of hope is of importance, in particular, for the suicide risk. Decreased hope imposes the likelihood of severe consequences in individuals suffering loneliness (Öztürk et al., 2018). Loneliness is widely experienced by individuals with schizophrenia because of social dysfunction, reduced social network, and impaired social skills (Fulford et al., 2021). A qualitative study reported that loneliness precipitated the disorder for some schizophrenia patients but, for some patients, it was a way of coping with the illness (Vural & Köroğlu, 2020). Individuals diagnosed with schizophrenia in Japan were found to experience increased levels of loneliness (Shioda et al., 2016). A study comparing 116 individuals with schizophrenia to 106 individuals with no psychiatric disorders reported that the level of loneliness was almost one standard deviation higher in the schizophrenia group (Eglit et al., 2018). However, another study on 15,647 participants reported a moderate correlation between psychosis and loneliness (Michalska da Rocha et al., 2018).

It is important to develop strategies to improve medication adherence, indicating the need for studies about this subject matter. Although there are many studies in the literature about medication adherence and insight levels of people diagnosed with schizophrenia, no study has been found examining the effects of loneliness and hope levels (Dufort & Zipursky, 2019; Hsieh et al., 2019; Settem et al., 2019; Yaegashi et al., 2020). Therefore, this study aimed to determine the effects of schizophrenia patients' insight, loneliness, and hope levels on adherence to treatment by collecting information about potential variables that affect their medication adherence. Thus, the study would contribute to the literature paving the way for the conduct of scientific studies and the implementation of strategies, which would improve medication adherence.

## 2 | DESIGN AND METHODS

### 2.1 | Aim of the research

This study aimed to determine the effect of schizophrenic patients' levels of insight, loneliness, and hope on adherence to treatment. To this end, the following questions were asked.

- What are the medication adherence levels of schizophrenic patients?
- What is the relationship between medication adherence and levels of insight, loneliness, and hope in schizophrenic patients?
- What are the effects of personal characteristics and levels of insight, loneliness, and hope of schizophrenic patients on medication adherence levels?

### 2.2 | Research design and participants

This is a descriptive and analytical study designed to determine the factors affecting medication adherence in patients with schizophrenia. The study was carried out in the period between March 2021 and August 2021 in Kırşehir, one of the provinces close to the capital in the inner and middle part of Turkey. The study population consisted of 400 patients registered with Kırşehir Community Mental Health Center. Sample size estimation from a known population ( $n = (N \cdot (\sigma^2 \cdot Z_{\alpha}) / ((N-1) \cdot d^2))$ ) was used as a method to find out the number of individuals to be included in the study. Using a 95% confidence interval, a margin of error of 5%, and  $Z_{\alpha} = 1.96$  for  $\alpha = 0.05$ , a sample size of 197 patients was calculated ( $400 \times ((0.5)^2 \times 1.96) / (399 \times (0.05)^2) = 19,649 \cong 197$ ). Of the patients, who agreed to participate, 202 patients completed the study. Research data were collected through face-to-face interviews with patients. Necessary precautions were taken (the use of surgical masks, keeping an adequate physical distance between individuals, and the practice of appropriate procedures to ensure hygiene, etc.) to avoid the spread of infections during the pandemic. The inclusion criteria are to be a schizophrenic patient, to be in remission, to have received treatment for schizophrenia for more than 6 months, to understand and speak Turkish, to agree to participate in the study, and to have the consent of a guardian, if any. Exclusion criteria are not to have schizophrenia, to be in an acute attack period, to have received treatment for schizophrenia for less than 6 months, to have problems with understanding and speaking Turkish, to refuse to participate in the study, or not to have the consent of a guardian, if any.

### 2.3 | Data collection tools

#### 2.3.1 | Demographic information form

This form consisted of 10 questions to collect personal and disease-related information about participants. The form was developed by the researchers following a relevant literature review (Dufort & Zipursky, 2019; Fusar-Poli et al., 2014; Hernandez & Barrio, 2017; Serafini et al., 2011; Settem et al., 2019; Yaegashi et al., 2020).

#### 2.3.2 | Morisky medication adherence scale

The scale developed by Donald E. Morisky was adapted into Turkish by Yılmaz (2004). The scale consists of four items to be answered "yes," or "no," showing the patient's medication adherence at three levels: "high," "moderate," and "low." If all questions are answered "no," medication adherence is considered "high," if one or two questions are answered "yes," medication adherence is "moderate," if three or four questions are answered "yes," medication adherence is "low." The patients are considered "adherent" if they answer "no" to all questions and "non-adherent" if they answer "yes" to at least one

question. Because logistic regression was used in this study, two-category modeling was used. Patients that answered no to at least one of the four questions were categorized as nonadherent and patients that answered yes to all questions were categorized as adherent.

### 2.3.3 | Birchwood insight scale

The scale was developed by Birchwood et al. (1994), and its validity and reliability in Turkish were tested by Sakarya (2012). The scale assesses the awareness of the disease and the need for treatment, and what the symptoms are attributed to. Items 1 and 8 analyze awareness of symptoms, Items 2 and 7 analyze awareness of the disease, and Items 3, 4, 5, and 6 analyze awareness of the need for treatment. 0, 1, or 2 scores can be gained from all items. The scores of Items 1, 2, 7, and 8 directly contribute to the total score. However, the scores gained from Items 3, 4, 5, and 6 are added together and divided into two, and the resulting number contributes to the total score. A maximum of 12 and a minimum of 0 points can be obtained from the scale. A score of 12 points indicates the presence of complete insight and a score of 0 points indicates the lack of insight. A score of 9 points or higher is considered a good indicator of insight.

### 2.3.4 | UCLA loneliness scale-short form-8

Originally developed by Russell et al. (1978), it comprises 20 items of a 4-point Likert scale. The eight-item short form of the scale was developed by Doğan et al. (2011). The scale is scored on a 4-point scale from "1 = completely agree" to "4 = completely disagree," with reverse items (Items 3 and 6) to be reversely scored accordingly. In the scale, which is interpreted with the total score, the lowest possible score is 8 and the highest score is 32. High levels in the scores gained from the scale that does not have a cutoff score are associated with increased feelings of loneliness. It has been proven that the psychometric findings of the scale are reliable and valid, comparable to the results in the literature, in estimating the loneliness levels of the subjects. Increased scale scores indicate increased scores of loneliness.

### 2.3.5 | Trait hope scale

This 12-item and 8-point Likert scale was developed by Snyder et al. (1991). The validity and reliability of the scale in Turkish were tested by Tarhan and Bacanlı (2015). Each of the subdimensions of pathways thinking and agency thinking is assessed by four items. Items 1, 4, 6, and 8 evaluate pathways thinking; Items 2, 9, 10, and 12 evaluate agency thinking, and Items 3, 5, 7, and 11 are considered filler items. The subjects are asked to mark the degree to which the phrases in the items reflect their own situation on an 8-point Likert-type rating scale. A total score is obtained by summing the scores gained from

the subdimensions of pathways thinking and agency thinking. The lowest and the highest scores, which can be obtained from the scale are 8 and 64, respectively. Increased scale scores indicate increased levels of hope.

## 2.4 | Data analysis

SPSS 25.0 and JASP 0.14.1 statistical programs were used for statistical analysis in this study. Independent variables were examined in numbers and percentages. Internal consistency and reliability analyzes were performed on the measurement tools used in the study. Then, correlation coefficients between total scores of scales were calculated and, finally, multivariate logistic regression analysis was used to predict medication adherence categories.

## 3 | FINDINGS

Of the participants, 68.8% were men, 48.5% were single, 32.2% were from primary school or lower levels of education, 51.5% were from moderate-income levels, 83.3% were unemployed, 68.3% lived in a province, and 54% were smokers.

The mean age of the patients was  $44.47 \pm 12.88$  years and the mean duration of the disorder was  $16.975 \pm 10.929$  years (Table 1).

The internal consistency coefficient of the Morisky medication adherence scale (MMAS) used in the study was 0.723. The mean score from the Birchwood insight scale (BIS) was 6 and the internal consistency coefficient was 0.720. The mean score from the UCLA loneliness scale-short form-8 (ULS-8) was 19 and the internal consistency coefficient of the scale was 0.780. The mean score from the trait hope scale (THS) was 35 and the internal consistency coefficient of the scale was 0.730 (Table 2).

Among the scales used in the study, there was a weak positive correlation ( $r = 0.29$ ,  $p < 0.05$ ) between MMAS and BIS, and a weak negative correlation between MMAS and ULS-8 ( $r = -0.153$ ,  $p < 0.05$ ). A statistically significant negative moderate correlation was found between ULS-8 and THS ( $r = -0.469$ ,  $p < 0.05$ ) (Table 3).

To predict medication adherence, categories were defined as "adherent" and "non-adherent" as specified in the validity and reliability study of the scale. Multiple logistic regression analysis was performed using the forward Wald method. BIS, ULS-8, and THS scores, age, and duration of the disorder were used as quantitative continuous independent variables. Gender, education level, marital status, place of residence, income level, working status, and smoking status were used as categorical independent variables. The results showed the presence of model fit as revealed by the Hosmer and Lemeshow test ( $\chi^2$  HL (8) = 4.384;  $p > 0.05$ ). The model created according to the Nagelkerke pseudo-R<sup>2</sup> value accounts for 16.8% of the total variance of the model. The increase proportional to the percent correct classification by chance (50.0%) was 16.3% and the overall hit rate was 66.3% with this increase. Correct prediction rates were 64.4% for the nonadherent group and 68.3% for the

**TABLE 1** Demographic characteristics of patients

		N	%
Gender	Female	63	31.2
	Male	139	68.8
Marital status	Married	64	31.7
	Single	98	48.5
	Divorced	40	19.8
Education status	Primary school and lower	65	32.2
	Secondary school	40	19.8
	High school	57	28.2
	University and higher	40	19.8
Working status	Working	34	16.8
	Not working	168	83.2
Place of residence	Province	138	68.3
	District	37	18.3
	Village	27	13.4
Income level	Low	57	28.2
	Moderate	104	51.5
	Good	41	20.3
Smoking	Yes	109	54.0
	No	93	46.0
Medication adherence according to MMAS	Low	24	11.9
	Moderate	76	37.6
	High	102	50.5
Age	Mean ± SD	44.47 ± 12.88	
Duration of disorder (years)	Mean ± SD	16.97 ± 10.92	

Abbreviation: MMAS, Morisky medication adherence scale.

**TABLE 2** Internal consistency coefficients and mean scores of the scales used

	Min–Max	Median	Cronbach's $\alpha$ coefficient
MMAS <sup>a</sup>	–	–	0.723
BIS	0–12	6	0.720
ULS-8	8–32	19	0.780
THS	8–64	35	0.730

Abbreviations: BIS, Birchwood insight scale; MMAS, Morisky medication adherence scale; THS, trait hope scale; ULS-8, UCLA loneliness scale-short form-8.

<sup>a</sup>A score was not calculated as it was a categorical variable.

adherent group. The results of the Wald test showed that, of independent variables, BIS score ( $\chi^2$  Wald (1) = 16.474;  $p < 0.001$ ), ULS-8 score ( $\chi^2$  Wald (1) = 4.814;  $p < 0.05$ ), and smoking status ( $\chi^2$  Wald (1) = 5.149;  $p < 0.05$ ) were the statistically significant

**TABLE 3** Correlation between MMAS, BIS, ULS-8, and THS

	BIS	ULS-8	THS
MMAS	0.291	–0.153	0.018
	<b>&lt;0.001</b>	<b>0.030</b>	0.804
BIS		–0.055	–0.009
		0.439	0.904
ULS-8			–0.469
			<b>&lt;0.001</b>

Note: Bold values are  $p < 0.050$ .

Abbreviations: BIS, Birchwood insight scale; MMAS, Morisky medication adherence scale; THS, trait hope scale; ULS-8, UCLA loneliness scale-short form-8.

predictors of being categorized into adherent or nonadherent groups (Table 4).

## 4 | DISCUSSION

The results of the multiple logistic regression showed that the created model increased the rate of predicting medication adherence and nonadherence by 16.3% and was able to discriminate the categories with an overall hit rate of 66.3%. It was found that 50.5% of the patients participating in the study had high medication adherence, and MMAS was weakly and positively correlated with BIS and weakly and negatively correlated with ULS-8. The results of the Wald test showed that a 1-point increase in the BIS score as an independent variable predicted a 1.226 times increase in medication adherence. It was observed in a study that approximately 69% of 300 schizophrenia patients in the study had moderate levels of medication adherence and insight, and there was a strong and positive correlation between these two parameters (Kalkan & Kavak Budak, 2020). Another study on 373 schizophrenia patients living in the northern and central regions of Taiwan has reported that the medication adherence rate was 47.2% and correlated with therapeutic cooperation, insight, and medical social support (Hsieh et al. 2019). In a review study, a high level of insight about illness, positive attitude towards medication, types of atypical antipsychotics, less severe psychotic symptoms, and adequate social support were identified as factors of medication adherence (Tham et al., 2016). It was reported in a study that more than one-third of patients with schizophrenia had poor medication adherence and it was associated with global cognitive deficits, depressive symptoms, and the number of years in remission (Settem et al., 2019). In a meta-analysis on 2184 schizophrenic patients, factors associated with poor medication adherence were reported to be high symptom severity, increased frequency of dosing regimens, poor insight, and negative attitude towards medication (Yaegashi et al., 2020). Another study has reported that antipsychotic medication adherence was associated with poor insight, unpleasant adverse effects of medication, inadequate efficacy, and poor therapeutic alliance (Clifford et al., 2020).

**TABLE 4** Results of multiple logistic regression for predicting drug adherence

	<b>B</b>	SE	Wald	df	<b>p</b>	Exp (B)	95% CI for Exp (B)
BIS	0.203	0.050	16.474	1	<b>0.000</b>	1.226	1.111–1.352
ULS-8	−0.056	0.025	4.814	1	<b>0.028</b>	0.946	0.900–0.994
Smoking status	−0.696	0.307	5.149	1	<b>0.023</b>	0.499	0.273–0.910
Nagelkerke pseudo- $R^2$	0.168						

Note: Bold values are  $p < 0.050$ .

Abbreviations: BIS, Birchwood insight scale; CI, confidence interval; ULS-8, UCLA loneliness scale-short form-8.

It was highlighted in another study that lack of insight and inadequate family support were predictors of medication nonadherence (Dufort & Zipursky, 2019). It is observed that our research findings are consistent with the information in the literature. It can be suggested that increased insight helped individuals to accept the disorder, make realistic assessments about the disorder and treatment, notice their symptoms early, understand the necessity of medication use for the treatment, assume responsibility for coping effectively with the disorder, eventually contribute to improved medication adherence.

Another finding in the study was that a 1-point increase in the ULS-8 score causes a 0.946-fold decrease in medication adherence. Accordingly, it can be suggested that as the level of loneliness increases, medication adherence decreases. A study investigated problems reported by schizophrenic patients during stability. The most frequently reported problems were missed appointments and loneliness (Beebe, 2010). In another study, a positive and significant correlation between medication nonadherence was found with living alone and dissatisfaction with family support (Suttajit & Pilakanta, 2010). The examination of the relationship between perceived social support and treatment adherence in schizophrenic patients showed a low level of correlation between the percentage of months with good treatment adherence, and the average family support level (Rabinovitch et al., 2013). It is observed that family support is an important factor affecting medication adherence in schizophrenia, and as loneliness increases, nonadherence increases (Hernandez & Barrio, 2017). In another study, one of the predictors of drug nonadherence was found to be inadequate family support (Dufort & Zipursky, 2019). It is observed that our research findings are similar to the reports in the literature, with loneliness as a factor that increases non-adherence. It can be suggested that, in schizophrenia, which affects individuals' assessment of reality unfavorably and causes cognitive impairment and social isolation, medication adherence is impaired with increased loneliness resulting in negative impacts on the therapeutic alliance, a regular presence at follow-up visits, and motivation for regular and timely medication use. Increased loneliness also diminishes the likelihood of receiving support on such issues, impairing medication adherence further.

In our study, an examination of demographic data revealed a correlation between smoking status and medication adherence. Fifty-four percent of the participants were smokers. Medication adherence of nonsmokers was reduced by 0.499 times compared to smokers. In this study, it was found that the majority of the participants were smokers and smokers had higher levels of medication

adherence. Smoking is one of the major causes of early mortality and a common finding among individuals with schizophrenia. Study findings reported about the smoking status among schizophrenia patients are complicated in the literature. In one study, smoking was associated with low education levels, positive symptoms, high levels of physical aggression, and the use of first-generation antipsychotics (Mallet et al., 2019). In a meta-analysis investigating the smoking status in schizophrenia patients, smokers ( $n = 3591$ ) and nonsmokers ( $n = 2980$ ) were compared. It was found that among schizophrenia patients, positive symptoms were more severe but extrapyramidal side effects (EPS) were of lower severity in smokers compared to nonsmokers (Huang et al., 2019). A study on 196 people with schizophrenia reported that nonsmokers took lower doses of antipsychotics compared to smokers (Nedic Erjavec et al., 2017). A systematic review of 29 cross-sectional studies found that smokers had positive symptoms of higher severity and smoking reduced EPS. It has been reported that anhedonia may be another factor associated with higher severity of nicotine dependence in people with schizophrenia compared to the nonpsychiatric population (Ahnallen et al., 2012). Smoking goes beyond the mere definition of a bad habit in schizophrenia patients. Patients with schizophrenia may consume cigarettes to relieve some symptoms. The "self-medication" hypothesis suggests that patients could smoke to alleviate the severity of negative symptoms and EPS (An et al., 2016; Huang et al., 2019). It is thought that nicotine alters dopamine release in mesolimbic pathways and stimulates glutamatergic neurons in the prefrontal cortex, thereby increasing the glutamate and dopamine activity in the basal ganglia. It is argued that through such effects smoking reduces the negative symptoms of schizophrenia but increases the positive ones. It has been reported that nicotine reduces the concentrations of clozapine and olanzapine in the blood (Sagud et al. 2019). Therefore, it can be suggested that the reason for a severe addiction to smoking can be attributed to the positive effects of nicotine on dopaminergic, serotonergic, and glutamatergic systems, and to its effect leading to the reduction of medication side effects by reducing medication levels in the blood (self-medication hypothesis). It can be further suggested that smoking can be a way of avoiding defects in social skills in a patient isolated from society or in a patient, who does not know what to do to establish a social network in the community. It can be suggested that improved medication adherence in parallel with increased cigarette consumption occurs as an effort to cope with increased EPS associated with increased drug dosages.

## 4.1 | Implications for practice

In this study, it was found that the factors affecting the medication adherence of schizophrenia patients were the level of insight and the level of loneliness; however, the level of hope did not affect medication adherence significantly. High adherence to medication is very important for the treatment of schizophrenia, and this study can help suggest that improving patients' insight levels and social support systems can contribute to increasing medication adherence. In this respect, it can be thought that the interventions targeting insight and loneliness for schizophrenic patients by the mental health team will also positively affect medication adherence. The study also found that smokers had a higher medication adherence. It can be suggested that this finding reflects the attempts to cope with increasing drug doses/side effects in parallel with medication adherence. Smoking behavior is an important problem that causes many additional health problems in schizophrenia and it is recommended to plan interventions for schizophrenic patients to quit smoking.

## 4.2 | Limitations and suggestions for future studies

This study has several limitations. First, the schizophrenic patients included in the study were patients registered in a community mental health center. This may have led to the inclusion of patients who received institutional support and had a higher tendency to adhere to the treatment and may have prevented reaching patients who are not registered in an institution. In future studies, it is recommended to study schizophrenic patients who are not registered in an institution. Other limitations of the study include the fact that data were derived from self-reports and limited to the study period and the sample, and it did not allow to establish a cause-effect relationship because of the cross-sectional design of the study. Therefore, it is recommended for future studies to investigate the variables affecting medication adherence on larger samples with long-term evaluation.

### CONFLICT OF INTERESTS

The authors declare no conflict of interest.

### ETHICS STATEMENT

The study's compliance with ethical principles was evaluated by Kırşehir Ahi Evran University's Clinical Research Ethics Committee, and ethical approval no. 2021-03/33 was obtained on February 9, 2021. The data were collected in accordance with the Declaration of Helsinki after obtaining the consent of the participants and their guardians.

### DATA AVAILABILITY STATEMENT

Data available on request from the authors

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**How to cite this article:** Seki Öz, H., Ayhan, D., & Taktak, Ş. (2022). The effect of insight, loneliness, and hope levels on medication adherence in patients with schizophrenia. *Perspectives in Psychiatric Care*, 1–7. <https://doi.org/10.1111/ppc.13048>