



# Correlates of Negative Attitudes towards Medication in People with Schizophrenia

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## Abstract

Attitudes towards psychiatric medication are an important factor influencing the success of treatment. Mental health care in the region of Central and Eastern Europe remains biologically oriented, yet the attitudes of people with severe mental illnesses are largely unknown. In the present study, we aimed to analyze factors of attitudes toward psychopharmacological drugs among people with schizophrenia spectrum disorder who use community social services in the Czech Republic. Drug Attitude Inventory (DAI) was used as a primary research instrument and data were analyzed using a multivariable linear regression. The majority of respondents (78%) had positive attitudes towards psychopharmacological treatment. Additionally, attitudes towards psychopharmaceutical drugs did not differ with regard to sociodemographic characteristics except for family status. There was a significant negative correlation with the level of self-stigmatization and a significant positive correlation with the duration of treatment. Respondents who had repeated experiences with discontinuation of medication without a prior consultation with a psychiatrist had significantly worse attitudes towards medication than respondents without this experience. This study revealed evidence of a strong relationship between the attitudes toward medication and a history of discontinuation of taking medication and duration of treatment. Therefore, we suggest that interventions focused preventing the internalization of stigmatizing attitudes towards mental illness should be available to people with schizophrenia spectrum disorder, especially in the early stages of the illness – irrespective of the patient's age.

**Keywords** Adherence · Drug Attitude Inventory · Patient compliance · Psychotic disorders · Schizophrenia

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## Introduction

There is a general agreement, that non-adherence to medication in patients with schizophrenia spectrum disorder (SSD) worsens their overall health status and leads to a higher risk of relapse and re-hospitalization [1]. It also leads to higher use of services and, in turn, higher costs of treatment [2]. Non-adherence is also considered as a contributing factor of the “revolving door” phenomenon [3] and more common in patients with SSD than in other mental disorders or other medical conditions [4, 5]. Based on the previous research, up to 56% patients may be expected not to take the prescribed medication [6–9].

A lot of attention is being paid to possible factors of non-adherence. One of the strongest influencing causes of non-adherence is the patients’ attitude towards the prescribed medication. For instance, a positive attitude towards psychopharmacological medication was associated with a significantly lower re-hospitalization rate [10]. Other studies described a strong negative correlation between attitudes towards medication and levels of self-stigmatization [11–13]; and positive correlation between attitudes towards medication and the duration of treatment [12] or duration of illness [14]. However, some studies were unable to confirm the finding that attitudes towards drugs are related to the duration of the illness [15]. Attitudes toward psychopharmacological agents usually do not vary by any other sociodemographic variable but age [11, 14, 16].

The aim of this study was to investigate attitudes towards psychiatric medication and analyze potential factors impacting negative attitudes towards psychiatric medication in people with psychosis using community services in the Czech Republic. In line with previous research, we hypothesized that attitudes towards psychiatric medication would differ with regard to the duration of an illness and previous experiences with the treatment. On the other hand, we hypothesized that attitudes toward medication are not associated with any sociodemographic characteristics such as gender, education or family status.

## Methods

### Study Design

Data were collected within a cross-sectional study nested in a one-year cohort study of people with SSD using either inpatient or community services, in the Czech Republic [17]. The cohort was prospectively followed using research instruments focusing on community service consumption, met and unmet needs, global functioning, and experience with medication. Data were collected using self-report surveys and measures administered via structured interviews. The interviewers were trained on leading structured interviews and how to use the included questionnaires before the study started. The attitudes towards psychopharmacological treatment were surveyed in the second assessment of the cohort study.

### Participants

Participants were recruited from eight community mental health service centers in the Czech Republic, covering various areas to overlay sociodemographic differences among regions. For each community service provider site, clients diagnosed with SSD (ICD-10: F20–29) and consuming community services for at least three months, were identified. Clients

were not eligible to participate in the study if severe cognitive deficits were present or if their overall health condition prevented the client from being able to undergo the interview process.

The list of potentially eligible individuals who met inclusion criteria was created and numbers were randomly assigned to each of the potential respondents at each community service provider site. Then, in ascending order according to their assigned number, individuals were contacted by a social worker from a given community service provider.

## Measures

For the purpose of the cross-sectional study, only selected measurements were used in data analysis. These were chosen based on the literature review. However, the rest of the data was used for calculating unit costs of health and social psychiatric services in the Czech Republic [18] and economic modelling of costs of schizophrenia treatment in the Czech Republic [19] which were the key aims of the cohort study.

Sociodemographic data (gender, year of birth, family status, education) and variables linked to the experience of taking psychiatric medication were obtained through the Czech version of the Client Service Receipt Inventory (CSRI CZ) [20]. We examined the following variables related to the history of psychiatric care consumption and the medication or the treatment: psychiatric medication used in a long-acting injectable (LAI) form, psychiatric and non-psychiatric medication used, and duration of psychiatric care. To measure the duration of treatment, a question on respondents' age at the time of the first contact with psychiatric services was asked. To measure the experience with a discontinuation of psychiatric medication, respondents were asked to answer the question, "Have you ever discontinued your psychiatric medication without prior consultation with a psychiatrist".

In order to provide a comprehensive picture of attitudes towards medication, the following standardized measurements were used:

*Drug Attitude Inventory (DAI)* is a self-reported scale measuring attitudes towards psychiatric medication. The scale includes items such as "Medication makes me feel tired and sluggish" or "I take medication on my own free choice". Each answer in agreement to the given statement earns one point, whereas disagreement loses one point. 10-item version of DAI scale was used in the study. Sum scores range from -10 to 10. Higher score indicates a more positive attitude towards medication.

*The Internalized Stigma of Mental Illness (ISMI)* is a self-report measurement which has a 4-point Likert Scale measuring the agreement with particular items. The scale has been designed in cooperation with mental health outpatients [21] the brief version of ISMI scale has been shown as having comparable characteristics to the 29-item version in terms of reliability and validity [22]. Because of that, the 10-item version of ISMI was used to measure self-stigmatization of outpatients included in the sample. The Czech version of the ISMI scale was standardized with Cronbach's alpha being 0.91 and split-half 0.905 [23]. However, there are no Czech norms available for the 10-item version of the ISMI scale.

*Global Assessment of Functioning (GAF)* is a widely used measurement administered by trained interviewers. All interviewers in our study had been trained in the usage of GAF scale by a certified lecturer. On the scale from 0 to 100 the level of an individual social functioning with regard to the somatic and psychiatric symptoms is evaluated. GAF also positively correlates with other scales measuring the severity of symptoms – such as the Clinical Global Impression Scale (CGI) and Positive and Negative Symptom Scale (PANSS) [24].

## Statistical Analysis

Sociodemographic characteristics of the sample, levels of self-stigmatization, functioning and attitudes toward psychopharmacological drugs were assessed using descriptive statistics, as frequencies with proportions for categorical, and means with a standard deviation for continuous variables. Non-parametric methods were used to test the differences in the attitudes toward medication for categories of each sociodemographic characteristic. A multivariable linear regression was used to examine the association between attitudes toward psychiatric medication (measured by DAI) and the independent variables. The independent variables included sociodemographic variables (age, gender, family status, education), self-reported clinical characteristics (usage of LAI psychiatric medicine, experience with discontinuation in taking psychiatric medication, number of psychiatric medications taken daily, hospitalization within the last 2 years, duration of the psychiatric treatment), and other indicators supposed in literature to have an effect on patient's attitude to the use of medication. Backward elimination was performed to obtain statistically significant risk factors related to the dependent variable DAI score. In executing the regression, the variable with the highest  $p$  value was identified. Next, a multivariable linear regression was rerun without this variable. The criterion for the variable exclusion was  $p$  value  $>0.15$ . Data management and analysis were performed using the STATA statistical software, version 14.

## Results

### Participants

138 respondents participated in the cohort study. From the cohort, 5 respondents dropped out during the second phase for various reasons (2 were currently hospitalized, 2 could not be reached, 1 decided to leave the study). Therefore, a total of 133 respondents participated in the cross-sectional study. Main characteristics of the cross-sectional study sample ( $n = 133$ ) are illustrated in Table 1.

### Outcomes

As reported in Table 1, a third of respondents had been taking LAI at this phase of the study and the same proportion of respondents repeatedly discontinued medication without prior psychiatric consultation. However, the chi-square test did not show any significant influence of experiences with discontinuing the psychiatric medication on sociodemographic characteristics, i.e. gender, age, education, family status and whether the respondent is currently following the LAI regime.

Our data revealed prevalently positive attitudes towards psychiatric medication (78%) among patients with psychosis. The mean DAI score was 3.2; the median was 4. Additionally, nonparametric statistical methods did not reveal any significant differences in the median of DAI scores by gender, education and region. The Mann-Whitney U Test did not show any significant differences in DAI scores in terms of gender ( $p = 0.711$ ). Similarly, the Kruskal-Wallis Test did not detect any differences in DAI scores in terms of education ( $p = 0.677$ ) and region ( $p = 0.467$ ). However, attitudes toward medication significantly differed with regard to family status ( $p < 0.001$ ).

**Table 1** Sample characteristics ( $N = 133$ )

		N (%) or Mean (SD)
Gender	Male	70 (52.6)
	Female	63 (47.4)
Age		42.3 (11.0)
Family status	Single	80 (60.1)
	Unmarried with a partner	15 (11.3)
	Married	12 (9.0)
	Divorced	25 (18.8)
	Widowed	1 (0.8)
Highest obtained degree	Primary	22 (16.5)
	Vocational	43 (32.3)
	Secondary	51 (38.4)
	Higher education	16 (12.0)
	Unknown	1 (0.8)
Years in psychiatric care (self-reported)		17.7 (10.5)
Hospitalization within the last 2 years (self-reported)	No	75 (59.1)
	Yes	52 (40.9)
Long-acting injectable medication (self-reported)	No	87 (66.4)
	Yes	44 (33.6)
Discontinuation of psychiatric medication (self-reported)	No	65 (51.2)
	Yes, just once	17 (13.4)
	Yes, more than once	45 (35.4)
Number of psychiatric medications taken (self-reported)		3.1 (1.7)
ISMI		2.3 (0.5)
GAF		53.6 (11.9)
DAI		3.2(4.7)

## Main Results

Multivariable linear regression model revealed attitudes toward medication were significantly associated with the following variables: family status, duration of treatment, experience with discontinuation of medication without previous psychiatric consultation, number of used psychiatric drugs and self-stigma. On the other hand, LAI usage, GAF scores, hospitalization within the last 2 years, education, gender, and age were not significantly associated with attitudes toward medication. A strong collinearity between the age and years in psychiatric care was identified; therefore, age was not included in the final model. The results of the final regression model (adjusted  $R^2 = 0.28$ ) are presented in Table 2.

## Discussion

The attitude towards medication is an important and complex variable to measure for long-term treatment success. As a common proxy variable for attitudes, studies have been using adherence to the prescribed medication. Literature has shown that attitudes barely change during the course of ongoing treatment [25]. The concept of attitudes towards medication is, however, often misunderstood and interchanged with the concept of adherence.

Specifically, the DAI instrument employed in our and many other studies, does not provide valid information regarding adherence.

**Table 2** Multivariable linear regression model for DAI. The final model.

DAI	Coef.	Standard error (Beta)	<i>p</i> value	95% CI	
Education					
Primary	Ref.				
Vocational	1.00	1.19	0.401	- 1.35	3.36
Secondary	1.75	1.19	0.145	- 0.62	4.13
Higher education	1.34	1.47	0.364	- 1.58	4.26
Family status					
Single, Widow(er)	Ref.				
Unmarried with a partner	- 4.51	1.22	<b>&lt; 0.001</b>	- 6.93	- 2.09
Married	- 1.39	1.45	0.339	- 4.27	1.48
Divorced	- 0.79	0.96	0.411	- 2.70	1.11
Hospitalization within the last 2 years (self-reported)					
	1.16	0.79	0.145	- 0.40	2.72
Years in psychiatric care (self-reported)					
	0.11	0.24	<b>0.007</b>	0.03	0.19
Discontinuation of psychiatric medication (self-reported)					
Yes, more than once	Ref.				
Yes, just once	1.85	1.23	0.137	- 0.60	4.30
No	2.91	0.86	<b>0.001</b>	1.21	4.62
Number of psychiatric medication taken (self-reported)					
	0.64	0.24	<b>0.008</b>	0.17	1.10
ISMI					
	- 2.25	0.89	<b>0.013</b>	- 4.02	- 0.48
Constant	1.73	2.32	0.457	-2.86	6.32

Bold *p*-values indicate results significant on the level of 0.05

“The clinical importance of the subjective response (measured by DAI) is based on its ability to predict drug compliance and disease outcome” [16].

Yet, the DAI scale is frequently being used as a self-report measure of adherence in studies [11, 26, 27]. Despite the fact that a correlation between attitudes towards medication, as measured by DAI, and adherence to treatment was described in previous studies [6, 9, 16, 28], it is essential to be aware of the differences. Neglecting to do so, may otherwise lead to a misinterpretation of analysis and may lead to inaccurate clinical recommendations.

In this study, we aimed to describe determinants of negative attitudes to medication:

There was no significant relationship between the experience with discontinuation and *age* in our sample. This is corroborated by previous findings from other studies, which also did not reveal a relationship between the level of adherence and age [6]. Neither did the studies measuring attitudes towards medication with regard to age find any relationship between these two variables [11, 14, 16].

However, the *duration of treatment* did show a significant positive influence on the attitude towards psychiatric medication. Despite a collinearity between age and the duration of treatment in our sample, our finding that the patient’s attitude towards psychiatric medication was positively affected for each year of ongoing treatment is in agreement with previous research [6, 14]. This finding also supports the recommendation to provide patients with SSD with the psychoeducation as soon as possible after the first symptoms have been discovered. This recommendation is based on previous research revealing the positive impact of psychoeducation on knowledge [29, 30] and attitudes [31] of people with schizophrenia and their families. Knowledge, attitudes and behavior are considered to be the three main parts of

stigmatizing attitudes towards mental illness [32]. Therefore, more attention should be paid by clinicians at the patients in early stages of the illness irrespective of patient's age.

In terms of stigma, our data revealed higher levels of *internalized stigma* of mental illness to be significantly and positively correlated with attitudes towards psychiatric medication. Higher levels of stigma were related to more negative attitudes to psychiatric medication. This finding confirms previous literature for a Czech sample in which the level of self-stigma was significantly associated with the risk of discontinuation of taking psychiatric medication without prior consultation of a psychiatrist [4]. Since analysis showed that people with higher levels of self-stigmatization have significantly worse attitudes towards medication, it can be assumed that a successful acceptance of the illness itself and the level of insight may have a positive impact on the level of self-stigmatization [33]. Other studies are also in agreement with our findings [11, 13, 34, 35], showing a clear evidence of a strong negative relationship between levels of self-stigmatization (measured by ISMI) and attitudes toward medication.

Besides that, our model suggested that there is new evidence that *family status* significantly affects the attitudes toward medication, and that unmarried people with a partner report significantly worse attitudes toward medication when compared to singles. One interpretation may be, that this may be influenced by side-effects of antipsychotic medication, especially possible sexual dysfunction [36, 37]. However, additional research is needed to confirm this finding and this suggestion as well.

A significant negative correlation between *previous discontinuation* of psychiatric medication without prior consultation with a psychiatrist and attitudes towards psychiatric medication has been revealed using our model. However, our study also revealed that there was no difference between the attitude towards medication of people who stopped taking medication only once and those who had never discontinued.

Previous research has identified the number of hospitalizations as a predictor of negative attitudes to medication [14]. In contrast for our data, the hospitalizations within the last two years did not appear to be a significant factor influencing the attitudes to medication. However, patients' experience of admission to the hospital and attitudes of hospital staff may play a role [33, 38]. Therefore, further research is needed to answer the question to which extent the experience of discontinuation is triggered or motivated by personal negative experience with treatment (e.g. side-effects, traumatizing experience with hospitalisation).

## Limitations

Some limitations to the study must be addressed: First, due to the nature of a cross-sectional study design, it is impossible to infer causality of possible predictors and factors included in the regression model. It can be assumed that attitudes towards medication are formed even before onset of illness. In this sense, preconceived attitudes lead to a particular kind of behavior such as the discontinuation of medication. However, our conclusions are based on the rationale that attitudes toward medication and medication-related behaviour do not always correspond.

Second, the fact that the duration of illness was designed as a variable calculated from a self-reported age of initial contact with psychiatric care poses a potential risk of bias. Similarly, the self-reported information about participants' medication issues were not cross-referenced with medical records. Unfortunately, the research team did not have access to medical records and therefore, was not able to compare the attitudes to medication with actual levels of adherence.

Finally, several studies have documented a relationship between the type of antipsychotics taken and attitudes toward medication. For the purpose of this analysis, the sample was

clustered based on types of psychiatric medication taken, i.e. atypical, typical, both, or none. Unfortunately, there was a strong disproportion in the representation of these groups, only 6 respondents from the sample took typical antipsychotics. Therefore, this variable could not be included in the analysis.

## Summary

The study indicates that attitudes towards psychiatric medication among outpatients with psychosis in the Czech Republic are predominantly positive. The results of this study support findings from other studies conducted in different settings including (1) the level of education did not significantly predict attitudes toward psychiatric medication [6, 14, 15], (2) there was a negative relationship between the level of self-stigmatization and the attitude to medication [13, 34, 35], and (3) there was a linear relationship between the duration of treatment and the attitudes to medication and adherence [6, 14]. However, a number of other factors, which – to our best knowledge – have not been previously known, were found to have an impact on attitudes toward medication. Firstly, experience with repeated discontinuation of medication without prior consultation with a psychiatrist appears to be a significant factor negatively influencing attitudes toward medication. Secondly, a positive linear relationship between the number of used psychiatric drugs and attitudes toward medication has been found. Thirdly, there is new evidence that family status significantly affects the attitudes toward medication, and that unmarried people with a partner report significantly worse attitudes toward medication than singles.

## Conclusion

The overall attitudes towards psychiatric medication in community service clients are positive. Considering the importance of adherence, which is triggered also by attitudes towards medication, appropriate intervention to promote improved attitudes should be provided to each patient with a severe mental illness. Based on the determinants of negative attitudes towards psychiatric medication, which were identified in the study, those interventions should be focused on the patients in early stages of illness, irrespective of age; should cover the prevention of internalization of stigmatizing attitudes towards mental illness and should be patient-specific (with regard to family status and possibility of traumatizing experience with a treatment).

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## Compliance with Ethical Standards

**Disclosure of Potential Conflicts of Interest** The authors declare that they have no conflict of interest.

**Research Involving Human Participants and/or Animals** All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional review board of the Prague Psychiatric Centre (currently the National Institute of Mental Health, Czech Republic) and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

**Ethical Approval** Ethical approval was gained from the institutional of the Prague Psychiatric Centre (currently the National Institute of Mental Health, Czech Republic).



**Informed Consent** Informed consent was obtained from all individual participants included in the study.

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