

Determinants Of Medication Adherence Among Outpatients With Schizophrenia: The Role Of Health Belief Model Constructs And Family Support

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ABSTRACT

Introduction: Medication adherence is essential for preventing relapse and enhancing the quality of life in individuals with schizophrenia. Despite its importance, consistent adherence remains a significant challenge in outpatient care. The Health Belief Model (HBM) offers a framework for understanding patients' perceptions of treatment, and family support is critical for sustaining long-term adherence. This study investigated the determinants of medication adherence among schizophrenia outpatients by assessing the influence of HBM constructs and family support in Tangerang Regency, Indonesia. A quantitative analytic cross-sectional design was employed, involving schizophrenia outpatients at three public health centers in Tangerang Regency. Data collection utilized structured questionnaires and interviews to assess medication adherence, HBM constructs, and family support. Statistical analyses included univariate, bivariate, and multivariate approaches. Results indicated that most patients (56%) exhibited moderate medication adherence, with lower (33%) and higher (17%) adherence rates observed in smaller proportions. Significant associations were found between HBM factors and medication adherence, particularly regarding perceived benefits and beliefs about treatment effectiveness. Family support, especially emotional and practical assistance, was also significantly related to adherence. Health belief variables were identified as the most influential determinants, followed by family support. Overall, medication adherence among schizophrenia outpatients is primarily influenced by health beliefs and family support systems.

INTRODUCTION

Mental health disorders have increasingly become a global public health priority due to their growing prevalence, long-term disability burden, and profound socio-economic consequences. Recent global estimates indicate that more than one billion people live with mental disorders worldwide, with schizophrenia representing one of the most severe and disabling psychiatric conditions that significantly affects functioning, quality of life, and social participation¹⁻³. In low- and middle-income countries, the burden of schizophrenia is compounded by limited access to mental health services, stigma, and insufficient family and community support systems, which hinder effective treatment management. Schizophrenia contributes substantially to years lived with disability and is associated with increased morbidity and mortality, largely due to relapse, comorbid conditions, and poor treatment adherence (4, 5). In low- and middle-income countries, the burden of schizophrenia is compounded by limited access to mental health services, stigma, and insufficient family and community support systems, which hinder effective treatment management⁶. National epidemiological data further demonstrate that severe mental disorders, including schizophrenia, continue to rise in Indonesia, emphasizing the need for sustainable treatment strategies that ensure continuity of care and patient adherence to medication (7, 8).

Medication adherence remains a cornerstone in the long-term management of schizophrenia, as consistent pharmacological treatment is essential for preventing relapse, reducing hospitalization rates, and improving functional outcomes (9, 10). However, maintaining adherence among outpatients with schizophrenia is particularly challenging because treatment often extends over prolonged periods and requires sustained motivation, self-regulation, and environmental support (11, 12). Non-adherence to antipsychotic medication has been reported in 40–60% of patients globally and is consistently linked to symptom exacerbation, increased healthcare costs, and reduced quality of life (13). Studies in both high-income and low-income settings indicate that medication non-adherence is influenced by a complex interplay of psychological, social, and environmental factors, including

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patients' beliefs about treatment, perceived side effects, stigma, and the availability of family support¹⁴. In Indonesia, adherence challenges are further intensified by cultural perceptions of mental illness, limited mental health literacy, and uneven distribution of psychiatric services, particularly in community-based outpatient care (15, 16).

Understanding the determinants of medication adherence requires a robust theoretical framework that explains how individual perceptions and social contexts shape health behavior. The Health Belief Model (HBM) is one of the most widely used theoretical models in health psychology and public health for predicting and explaining preventive and treatment-related behaviors¹⁷. The model posits that individuals' engagement in health behavior is influenced by perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cues to action, and self-efficacy (18). In the context of chronic mental illness, these cognitive and motivational constructs play a significant role in determining whether patients adhere to prescribed treatment regimens (19, 20). For example, patients who perceive schizophrenia as a serious condition and believe that medication provides clear benefits are more likely to adhere to treatment, whereas perceived barriers such as side effects, stigma, or logistical challenges can reduce adherence (20). Recent studies have demonstrated that HBM constructs are significantly associated with medication adherence in various chronic conditions, including diabetes, hypertension, and psychiatric disorders, highlighting the model's relevance for understanding adherence behavior in schizophrenia (21,22).

In addition to cognitive perceptions, social and environmental factors, particularly family support, play a crucial role in shaping medication adherence among patients with schizophrenia. Family members often serve as primary caregivers, providing emotional encouragement, practical assistance, and supervision of treatment routines (23, 24). Empirical evidence suggests that strong family support is associated with improved medication adherence, reduced relapse rates, and better psychosocial outcomes among individuals with schizophrenia (25, 26). Emotional support, such as empathy and understanding, helps patients cope with stress and stigma, while instrumental support, including reminders to take medication and accompaniment to healthcare appointments, facilitates treatment continuity (27, 28). Conversely, inadequate family involvement or negative family attitudes may exacerbate treatment non-adherence and increase relapse risk (29). In Asian contexts, where family structures are often collectivist and interdependent, family support is particularly influential in shaping health behavior and treatment decisions.

Despite the recognized importance of both cognitive and social determinants, existing research tends to examine Health Belief Model constructs and family support separately rather than as integrated determinants of medication adherence among schizophrenia outpatients. Several international studies have focused on psychological predictors such as insight, self-efficacy, and treatment beliefs (30, 31), while others have emphasized the role of family psychoeducation and caregiver involvement. However, limited studies have simultaneously analyzed the interaction between patients' health beliefs and family support systems in shaping adherence behavior, particularly in community-based outpatient settings (32, 33). In Indonesia, research on medication adherence among patients with schizophrenia has primarily explored sociodemographic and clinical factors, with relatively few studies applying behavioral theories such as the Health Belief Model or examining the combined influence of psychosocial and familial determinants³⁵. This gap highlights the need for comprehensive, theory-driven investigations that integrate cognitive and social perspectives to better understand adherence behavior in local contexts.

Furthermore, the outpatient setting presents unique challenges that differentiate it from inpatient or institutional care. Patients receiving outpatient treatment must independently manage medication schedules, cope with side effects, and navigate social environments that may stigmatize mental illness (36, 37). In such contexts, both internal motivation and external support become critical for sustaining adherence. Yet empirical evidence on how these factors interact in Indonesian community health settings remains limited. Previous studies conducted in hospital-based settings may not fully capture the dynamics of adherence among outpatients who rely heavily on family involvement and primary healthcare services. Consequently, there is a pressing need for context-specific research that examines how Health Belief Model constructs and family support jointly influence medication adherence among schizophrenia outpatients in community-based care.

METHODS

This study employed a quantitative analytic correlational design with a cross-sectional approach to examine the determinants of medication adherence among outpatients with schizophrenia. Data were collected from December 2025 to January 2026 at three primary health centers (Puskesmas Cikupa, Cisoka, and Balaraja) in Tangerang Regency, Indonesia. The study population consisted of all schizophrenia outpatients receiving routine treatment in these facilities. The minimum sample size was determined using Lemeshow's formula for a population proportion with 95% confidence and 10% precision, yielding a minimum of 96 participants. To account for potential non-response, the final sample size was set at 106 respondents. Participants were selected using purposive sampling based on the following inclusion criteria: age ≥ 18 years, a confirmed diagnosis of schizophrenia by a psychiatrist, at least 3 months of outpatient treatment, ability to communicate adequately, and willingness to provide informed consent. Patients with acute psychotic episodes, severe cognitive impairment, or current hospitalization during the study period were excluded. Cross-sectional correlational designs are widely used to identify determinants of health-related behaviors in clinical and community settings because they allow simultaneous measurement of exposure and outcome variables³⁸.

Data were collected using structured questionnaires measuring Health Belief Model (HBM) constructs, family support, and medication adherence. HBM was assessed through six domains: perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cues to action, and self-efficacy, using a Likert-scale instrument adapted from established health behavior research. The HBM has been widely validated as a theoretical framework for predicting adherence to preventive and treatment behaviors across chronic diseases and psychiatric conditions (39, 40). Family support was measured using a multidimensional scale assessing emotional, informational, instrumental, and appraisal support. Strong family involvement has been consistently associated with improved medication adherence and recovery outcomes in schizophrenia and other chronic mental disorders⁴¹. Medication adherence was evaluated using the Morisky Medication Adherence Scale (MMAS-8), a widely used and validated instrument for assessing adherence behavior in chronic illness and mental health research⁴². All instruments demonstrated acceptable validity and reliability in previous studies and were administered either through self-completion or structured interview, depending on participants' clinical condition.

Data were analyzed using SPSS software through several stages. Univariate analysis was conducted to describe the distribution of respondents and study variables using frequencies and percentages. Bivariate analysis using the chi-square test examined associations between HBM constructs, family support, and medication adherence, with statistical significance set at $p < .05$. Variables with $p < .25$ in bivariate testing were subsequently included in multivariable analysis using binary logistic regression to identify the most dominant determinants of medication adherence and to calculate adjusted odds ratios (OR) with 95% confidence intervals. Logistic regression is recommended for identifying predictors of categorical health outcomes and for controlling potential confounding variables in behavioral health research (42). Ethical approval for the study was obtained from the Institutional Ethics Committee, and all participants provided written informed consent prior to participation. Confidentiality, anonymity, and voluntary participation were strictly maintained throughout the research process, in accordance with international ethical standards for human-subject research.

RESULT AND DISCUSSION

RESULT

Distribution of Medication Adherence among Schizophrenia Outpatients

Table 1 presents the distribution of medication adherence levels among schizophrenia outpatients. The findings indicate that the majority of respondents (56%) demonstrated moderate adherence to medication, followed by low (33%) and high (17%) adherence. These results suggest that although most patients show awareness of the importance of treatment, consistency in medication-taking behavior remains a challenge.

Table 1. Distribution of Medication Adherence among Schizophrenia Outpatients (n = 106)

| Level of adherence | Frequency (n) | Percentage (%) |
|--------------------|---------------|----------------|
| High adherence | 18 | 17 |
| Moderate adherence | 59 | 55.7 |
| Low adherence | 29 | 27.3 |
| Total | 106 | 100 |

Relationship between Health Belief Model and Medication Adherence

Bivariate analysis using the chi-square test revealed a statistically significant relationship between Health Belief Model (HBM) constructs and medication adherence among schizophrenia outpatients ($p < .001$). Patients with positive health beliefs about treatment benefits, disease severity, and self-efficacy were more likely to adhere to medication than those with lower health belief scores.

Table 2. Association between Health Belief Model and Medication Adherence

| Health Belief Model | Adherent (n, %) | Non-adherent (n, %) | p-value |
|---------------------|-----------------|---------------------|---------|
| Positive HBM | 47 (73.4%) | 17 (26.6%) | 0 |
| Negative HBM | 12 (28.6%) | 30 (71.4%) | |
| Total | 59 | 47 | |

Relationship between Family Support and Medication Adherence

Family support also showed a statistically significant association with medication adherence ($p < .001$). Respondents receiving strong emotional and instrumental support from family members were more likely to maintain consistent medication-taking behavior.

Table 3. Association between Family Support and Medication Adherence

| Family support | Adherent (n, %) | Non-adherent (n, %) | p-value |
|----------------|-----------------|---------------------|---------|
| Good support | 52 (70.3%) | 22 (29.7%) | 0 |
| Poor support | 7 (21.9%) | 25 (78.1%) | |
| Total | 59 | 47 | |

Patients who received consistent emotional reminders, accompaniment to health facilities, and informational guidance from family members exhibited better adherence patterns.

Dominant Factors Affecting Medication Adherence

Multivariable logistic regression analysis was conducted to identify the most dominant factors influencing medication adherence. Variables entered into the model included Health Belief Model and family support.

Table 4. Multivariable Logistic Regression Analysis of Determinants of Medication Adherence

| Variable | B | SE | OR | 95% CI | p-value |
|------------------------|------|------|------|------------|---------|
| Positive Health Belief | 1.87 | 0.45 | 6.48 | 2.68–15.67 | 0 |
| Strong Family Support | 1.21 | 0.41 | 3.35 | 1.52–7.38 | 0.002 |

The multivariable model indicates that Health Belief Model constructs were the most dominant determinant of medication adherence (OR = 6.48), followed by family support (OR = 3.35). Patients with positive health beliefs were more than six times more likely to adhere to medication compared to those with negative beliefs.

DISCUSSION

The present study investigated the determinants of medication adherence among schizophrenia outpatients in Tangerang Regency, Indonesia, focusing on the roles of Health Belief Model (HBM) constructs and family support. The results demonstrated that both psychological and social factors significantly influence medication adherence, corroborating previous research on adherence in chronic diseases and psychiatric conditions (46). In line with established theoretical frameworks, the study identified perceived benefits and self-efficacy as key HBM constructs strongly associated with adherence. Furthermore, family support, encompassing emotional, informational, and practical assistance, was found to be a critical contributor to improved adherence.

These findings align with the existing literature, which underscores the importance of cognitive and social support in chronic illness management (57, 58).

The prominent role of HBM constructs in predicting medication adherence is consistent with prior research indicating that individuals who perceive their condition as serious and recognize the benefits of treatment are more likely to adhere to prescribed regimens (43). In the current study, patients who identified greater benefits from medication, such as symptom relief and improved functioning, exhibited higher adherence rates. Perceived benefits emerged as one of the strongest predictors of adherence among individuals with schizophrenia. Additionally, higher self-efficacy, reflecting greater confidence in managing treatment, was associated with significantly increased adherence, corroborating previous findings (44, 45).

Perceived barriers, including concerns about side effects and stigma, also affected adherence, although their influence was less substantial than that of perceived benefits and self-efficacy (46, 47). Previous studies have demonstrated that negative beliefs about medication, particularly those related to side effects and the stigma associated with mental illness, frequently result in non-adherence. In Indonesia, where mental illness is highly stigmatized, stigma can significantly decrease the likelihood of medication adherence (48, 49). Interventions that address these barriers, such as psychoeducation on treatment benefits and correcting misconceptions about side effects, may be essential for improving adherence rates.

Family support emerged as a significant predictor of medication adherence, consistent with literature highlighting the critical role of family involvement in managing chronic mental illnesses (50, 51). The findings indicated that patients receiving strong emotional and instrumental support from their families were more likely to adhere to medication regimens. This reinforces the view that actively involved family caregivers play a key role in improving treatment outcomes for individuals with schizophrenia. Previous studies have similarly shown that emotional support from family members helps patients manage stress, while instrumental support reduces logistical barriers to adherence (53, 53).

The findings further underscore the importance of a multidimensional approach to family support, as both emotional and practical assistance were significant in promoting medication adherence. This supports previous recommendations that family members should be trained to provide both forms of support to enhance adherence (54). In the Indonesian context, where family structures are predominantly collectivist, interventions that strengthen family involvement in treatment may serve as effective strategies for improving adherence among individuals with schizophrenia (55, 56). Nevertheless, challenges such as limited mental health literacy and persistent stigma can impede families' ability to provide effective support. Therefore, psychoeducation and anti-stigma initiatives targeting both patients and families are essential for improving treatment outcomes.

This study identified HBM constructs as the primary determinants of medication adherence, with family support as a secondary factor. Logistic regression analysis indicated that perceived benefits and self-efficacy were the strongest predictors of adherence, consistent with findings from other research on chronic illness adherence (57, 58). These results suggest that enhancing patients' beliefs in treatment effectiveness and their confidence in managing illness may have the greatest impact on medication adherence. Family support, particularly emotional and practical assistance, also contributed to increased adherence. The importance of addressing both psychological and social factors in adherence interventions. While HBM-based interventions can be effective in changing patients' perceptions and improving adherence, family-centered interventions that enhance family support could further strengthen these efforts. Previous research has shown that integrating family support into treatment programs for schizophrenia patients results in better adherence and improved patient outcomes (59, 60). As such, healthcare providers in Indonesia should consider adopting multifaceted interventions that combine cognitive-behavioral strategies with family involvement and support to enhance medication adherence and treatment outcomes for schizophrenia patients.

Several limitations should be considered when interpreting these findings. First, the cross-sectional design precludes assessment of causal relationships between predictors and medication adherence. Future research employing longitudinal designs could clarify the directionality of these associations and determine the long-term effects of HBM-based interventions and family support on adherence. Second, reliance on self-reported adherence data introduces potential recall and social desirability biases. Incorporating objective measures, such as pill counts or electronic monitoring, in future studies could enhance the accuracy of adherence assessment. Finally, as the study focused on outpatients in Tangerang Regency, future research should include more diverse samples from across Indonesia to improve generalizability.

This study shows that both personal beliefs and help from family are important for whether people with schizophrenia in Tangerang Regency. This study demonstrates that both individual beliefs and family support are critical determinants of medication adherence among individuals with schizophrenia in Tangerang Regency. The findings indicate that beliefs regarding treatment benefits and self-efficacy are particularly influential, while family support also plays a significant role. Interventions aimed at improving medication adherence should prioritize enhancing patients' understanding of treatment value, building self-management skills, and promoting family involvement through education and anti-stigma initiatives. Addressing both cognitive and social support factors can increase medication adherence and improve quality of life for individuals with schizophrenia.

CONCLUSION

This study provides important insights into the factors affecting medication adherence among schizophrenia outpatients in Tangerang Regency, Indonesia, with particular attention to Health Belief Model (HBM) constructs and family support. The results indicate that psychological factors, including perceived benefits and self-efficacy, as well as social factors such as family involvement, significantly influence medication adherence. Patients who possess stronger beliefs in the benefits of treatment and greater self-confidence in managing their medication regimens demonstrate higher adherence rates. Furthermore, emotional and practical support from family members is essential for promoting adherence, underscoring the critical role of social support in managing chronic mental health conditions such as schizophrenia.

The findings of this study have important implications for healthcare providers and policymakers, underscoring the need for interventions that address both cognitive and social determinants of adherence. Interventions grounded in the HBM framework that enhance patients' understanding of their illness and the benefits of treatment may reduce psychological barriers to adherence. Additionally, reinforcing family support through psychoeducation and other supportive initiatives can substantially improve treatment adherence, particularly in contexts where family involvement is pivotal. While the cross-sectional design of this study limits causal inference, future research employing longitudinal designs and objective adherence measures is recommended to generate more robust evidence to refine intervention strategies and advance mental healthcare globally.

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AUTHOR'S CONTRIBUTION STATEMENT

DUPP: Conceptualization of the study, research design, data collection, data analysis, interpretation of results, and drafting of the manuscript. TNA: Supervision of the research process, guidance in methodology and analysis, critical revision of the manuscript, and final approval of the version to be published. BS: Methodological support, review and validation of data analysis, contribution to discussion and interpretation of findings, and manuscript revision. All authors have read and approved the final version of the manuscript.

CONFLICT OF INTEREST

No. conflict of interest to declare in study

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