

## Investigation of Anger Expression Styles in Patients with Schizophrenia and Their Clinical and Demographic Predictors

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### ABSTRACT:

**Purpose:** This study aimed to investigate the anger expression styles of individuals diagnosed with schizophrenia and to identify the clinical and sociodemographic factors influencing these styles.

**Methods:** A total of 70 inpatients diagnosed with schizophrenia participated in this descriptive and correlational study. Data were collected using the Personal Information Form, the Trait Anger and Anger Expression Inventory, and the Scale for the Assessment of Positive Symptoms (SAPS) and Scale for the Assessment of Negative Symptoms (SANS). Data were analyzed using nonparametric statistical methods including the Kruskal-Wallis test, Mann-Whitney U test, and Spearman correlation analysis.

**Results:** Anger control scores were significantly lower among male patients, unemployed individuals, and those residing in extended families. Patients with a history of violence and those who were non-adherent to medication demonstrated markedly elevated levels of trait anger ( $M = 27.01$ ,  $p = 0.003$ ) and outward-directed anger ( $M = 22.60$ ,  $p = 0.003$ ), alongside significantly reduced anger control scores ( $M = 16.86$ ,  $p = 0.003$ ) compared to their counterparts. Furthermore, outward-directed anger was positively correlated with the severity of positive formal thought disorder ( $r = .286$ ,  $p = 0.016$ ), while anger control showed a negative correlation with hallucination severity ( $r = -.276$ ,  $p = 0.021$ ).

**Conclusion:** The findings indicate that anger expression in individuals with schizophrenia is significantly influenced by both clinical symptoms and sociodemographic variables. The integration of anger assessment into routine psychiatric evaluations may enhance individualized treatment planning, contributing to improved symptom control, emotion regulation, and psychosocial functioning.

**Keywords:** Schizophrenia; anger; anger expression style; positive symptoms; negative symptoms

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### INTRODUCTION

Schizophrenia is a chronic and severe psychiatric disorder that significantly affects individuals, families, and society. Typically emerging in late adolescence or early adulthood, it is characterized by disruptions in thought processes, emotional regulation, and behavior. These impairments often lead to social withdrawal, distorted reality perception, and difficulties in maintaining interpersonal relationships (Ozturk & Ulusahin, 2023). Individuals with schizophrenia frequently

experience communication difficulties, self-care deficits, disorganized behavior, sleep disturbances, and cognitive impairments (Gulec et al., 2022; Lee et al., 2023; Yildiz & Cerit, 2021). Among the many challenges associated with schizophrenia, difficulties in anger regulation and aggression are particularly critical. These emotional responses are closely linked to the presence and severity of positive symptoms such as delusions and hallucinations (Ringer & Lysaker, 2023). Inadequate management of anger can increase the risk of self-harm and interpersonal

violence, thereby compromising patient safety, treatment adherence, and long-term prognosis (Reddy, 2023; Ringer & Lysaker, 2023). Anger is a fundamental human emotion triggered by perceived threats, injustice, or frustration, and may range from mild irritation to intense rage (Ruocco et al., 2023). Evidence suggests that individuals with schizophrenia, especially those with prominent positive symptoms, are more prone to experiencing and expressing anger in maladaptive ways (Engin et al., 2022; Kassinov & Tafrate, 2023; Modestin, 2023). A recent meta-analysis involving over 45,000 individuals with psychotic disorders highlighted the significant roles of delusions, hallucinations, and poor insight in the development of violent behaviors. In addition, elevated anxiety and panic attacks have been associated with both internalized and externalized anger expression among individuals with chronic schizophrenia (Gadea et al., 2023). Unregulated anger may serve as a precursor to self-injurious and aggressive behaviors, which hinder recovery and disrupt the therapeutic environment. Such behaviors not only pose safety concerns but also burden caregivers and contribute to institutional challenges (Bo et al., 2023; Fassino et al., 2023). Although the relationship between schizophrenia and aggression has been widely studied, there remains a notable gap in understanding how anger is expressed—specifically in terms of its inward or outward direction—and what demographic, clinical, and psychosocial factors influence these patterns (Modestin, 2023; Song & Min, 2023). In light of these considerations, the present study aims to examine anger expression styles and the associated demographic and clinical predictors in individuals with schizophrenia who are hospitalized in a psychiatric unit. A better understanding of anger expression dynamics may contribute to more accurate clinical assessments and the development of individualized intervention strategies to enhance emotional regulation and reduce potential risks.

## MATERIAL AND METHODS

### Purpose and Type of Study

This study aimed to examine the anger expression styles of individuals diagnosed with schizophrenia

and to identify the clinical and sociodemographic variables that predict these styles. Additionally, the study sought to explore the relationship between anger dimensions and the severity of positive and negative symptoms.

A descriptive and correlational research design with a cross-sectional approach was adopted.

### Sampling and Participants

The study population consisted of all patients diagnosed with schizophrenia according to DSM-5 criteria who were hospitalized in the psychiatry clinic of a university hospital between July 3, 2019, and January 3, 2020. During this period, a total of 80 patients met the diagnostic criteria. From this population, 70 inpatients (51 males and 19 females) were included in the study through purposive sampling, based on predefined inclusion and exclusion criteria. The inclusion criteria were as follows: (1) diagnosis of schizophrenia according to DSM-5 criteria for at least six months, (2) being in a clinically stable phase as evaluated by the attending psychiatrist—defined as the seventh day of hospitalization when acute symptoms had begun to subside, and (3) voluntary participation with informed consent.

Exclusion criteria included the presence of comorbid neurological or severe physical illnesses, substance use disorders, intellectual disabilities, or acute agitation that impaired communication. A post hoc power analysis was also conducted to evaluate the adequacy of the sample size. Based on a medium effect size (Cohen's  $d = 0.50$ ), a significance level of 0.05, and a desired statistical power of 0.90, the minimum required sample size was calculated to be approximately 44 participants. Since the study included 70 inpatients, the sample size was considered sufficient to detect statistically meaningful effects with high power.

### Data Collection Tools

1. Personal Information Form: This researcher-developed form consisted of 20 items assessing sociodemographic variables (e.g., age, gender, marital status, education level, employment status, family structure) and clinical characteristics (e.g., age at onset,

illness duration, medication adherence, history of violent behavior, and hospitalization history). Content validity was evaluated by three experts in psychiatric nursing and psychiatry.

2. State-Trait Anger Expression Inventory (STAXI): Originally developed by Spielberger (1988) and adapted into Turkish by Özer (1994), this 34-item scale measures four dimensions: trait anger, anger-in, anger-out, and anger control. Higher scores indicate greater levels of each construct. In the present study, Cronbach's alpha was 0.76, indicating acceptable internal consistency. Exploratory factor analysis supported a three-factor structure, with item loadings exceeding 0.40.
3. Scale for the Assessment of Positive Symptoms (SAPS): Originally developed by Nancy Andreasen and adapted into Turkish by Erkoç et al. (1991), this 35-item clinician-administered scale assesses the severity of positive symptoms in schizophrenia. It includes subdomains such as hallucinations, delusions, bizarre behavior, formal thought disorder, and inappropriate affect. In the current study, the internal consistency of the scale was found to be high (Cronbach's alpha = 0.87).
4. Scale for the Assessment of Negative Symptoms (SANS): Also developed by Andreasen and validated in Turkish by Erkoç et al. (1991), this 24-item scale measures the severity of negative symptoms across five domains: affective flattening, alogia, avolition, anhedonia/social withdrawal, and attention impairment. The internal consistency in the present study was excellent (Cronbach's alpha = 0.96), and the factor structure was supported by exploratory factor analysis.

Data was collected through structured, face-to-face interviews conducted in private rooms within the psychiatric unit. Each interview lasted approximately 30 minutes and was carried out by trained psychiatric nurses who were instructed in the

standardized administration of the instruments. Participants were informed about the study procedures and assured of confidentiality and anonymity.

### Statistical Analysis

Data was analyzed using non-parametric statistical methods, consistent with the ordinal nature of the scale scores and the non-normal distribution observed in preliminary analyses. The Mann–Whitney U test was employed for binary group comparisons (e.g., gender, employment status), and the Kruskal–Wallis H test was used for comparisons involving more than two groups (e.g., age of onset, family type, illness duration), as presented in Tables 2 and 3. Where significant differences were detected in Kruskal–Wallis tests, appropriate non-parametric post hoc comparisons were conducted using pairwise Mann–Whitney U tests with Bonferroni correction to adjust for multiple testing. Correlational relationships between subdimensions of anger expression and symptom severity scores (SAPS and SANS) were examined using Spearman's rank correlation coefficient, as shown in Table 5. Although the inclusion of effect sizes (e.g., Cohen's d, Spearman's r) was considered to enhance interpretability, these metrics were omitted from the results tables due to space constraints. Missing data was minimal (<5%) and handled using pairwise deletion. The level of statistical significance was set at  $p < 0.05$ .

### Ethical Approval

This study received ethical approval from the Non-Interventional Clinical Research Ethics Committee of Sivas Cumhuriyet University (Approval No: 2019/28, Date: 17.04.2019). All participants were informed about the objectives of the study and provided written informed consent prior to data collection. The study was conducted in accordance with the principles of the Declaration of Helsinki.

### RESULTS

Table 1 summarizes the demographic and clinical characteristics of the 70 participants. The mean age was  $38.86 \pm 5.46$  years (range: 23–70), and the majority were male (72.9%). Over half of the

participants had completed only primary education (51.4%) and most were unemployed (78.6%) and of low socioeconomic status (75.7%). Regarding clinical features, 40% had been diagnosed with schizophrenia for less than 10 years, and 42.9% had been in remission for up to 12 months. A significant proportion reported a history of violence (72.9%)

and non-adherence to medication (82.9%).

Table 2 presents the comparison of mean scores on trait anger and anger expression subscales according to sociodemographic characteristics. Female participants had significantly higher anger-in scores than males ( $z = 7.188$ ,  $p = 0.009$ ), indicating a greater tendency to internalize anger.

**Table 1.** Demographic and Clinical Characteristics

Characteristics	Number	Percent
Age ( $38.86 \pm 5.46$ ; 23-70)		
Gender (Male)	51	72.9
Education (Primary school)	36	51.4
Employment Status (Unemployed)	55	78.6
Socioeconomic Status (Low)	53	75.7
Marital Status (Single)	37	52.8
Duration of Illness		
Less than 10 years	28	40.0
11-20 years	31	44.3
21 years and above	11	15.7
Duration in Remission		
1-12 months	30	42.9
13-36 months	24	34.2
37 months and above	16	22.9
History of Violence (Present)	51	72.9
Medication Adherence (Non-adherent)	58	82.9

**Table 2.** Comparison of Mean Scores on Trait Anger and Anger Expression Subscales by Sociodemographic Characteristics in Patients with Schizophrenia

Variables	Trait Anger ( $\bar{X} \pm SD$ )	Anger-In ( $\bar{X} \pm SD$ )	Anger-Out ( $\bar{X} \pm SD$ )	Anger Control ( $\bar{X} \pm SD$ )	Test/p
Age (30 and below)	$26.07 \pm 6.67$	$21.67 \pm 3.64$	$22.33 \pm 5.90$	$17.07 \pm 5.04$	$z = 7.188$ ; $p = 0.009$
31-40 years	$25.52 \pm 5.26$	$20.28 \pm 2.70$	$20.60 \pm 5.72$	$18.48 \pm 3.45$	
Gender (Female)	$26.21 \pm 4.90$	$22.47 \pm 2.58$	$22.63 \pm 5.19$	$17.10 \pm 3.12$	
Male	$25.76 \pm 5.56$	$20.56 \pm 2.66$	$21.03 \pm 5.30$	$17.78 \pm 4.11$	$z = 4.222$ ; $p = 0.044$
Employment (Employed)	$24.06 \pm 5.29$	$21.06 \pm 2.78$	$19.33 \pm 4.99$	$18.80 \pm 4.44$	
Unemployed	$26.38 \pm 5.32$	$21.09 \pm 2.77$	$22.05 \pm 5.25$	$17.27 \pm 3.66$	
Family (Extended)	$29.00 \pm 4.62$	$21.87 \pm 2.74$	$26.00 \pm 3.54$	$15.62 \pm 2.66$	$KW = 3.819$ ; $p = 0.027$
Nuclear	$25.25 \pm 5.31$	$21.03 \pm 2.92$	$20.69 \pm 5.33$	$18.13 \pm 4.00$	

Unemployed individuals exhibited significantly higher anger-out scores compared to employed participants ( $z = 4.222$ ,  $p = 0.044$ ), suggesting increased externalized anger. Additionally, participants from extended families had significantly higher anger-out scores than those from nuclear families ( $KW = 3.819$ ,  $p = 0.027$ ), as revealed by follow-up pairwise comparisons. No statistically significant differences were observed in trait anger or anger control scores based on other

sociodemographic variables (e.g., age, marital status, education level, or income).

Table 3 examines the relationship between clinical variables and anger expression scores. A significant difference was found in anger-in scores according to the duration of illness ( $KW = 3.581$ ,  $p = 0.033$ ), with patients ill for less than 10 years reporting higher scores. Patients with a history of violence exhibited significantly higher trait anger ( $\bar{X} = 27.01$ ) and anger-out ( $\bar{X} = 22.60$ ) scores, and lower anger control

scores ( $\bar{X} = 16.86$ ), compared to those without such a history ( $p < 0.01$ ). Non-adherent patients demonstrated higher trait anger ( $\bar{X} = 26.77$ ) and anger-out ( $\bar{X} = 22.18$ ) scores, and lower anger control scores ( $\bar{X} = 17.06$ ), relative to adherent participants ( $p < 0.01$ ). No significant differences were observed based on age at onset, remission duration, or reason for hospitalization ( $p > 0.05$ ).

Table 4 presents significant correlations between anger expression scores and positive symptom domains. Anger-out was positively correlated with positive formal thought disorder ( $r = .286$ ,  $p = .016$ ), while anger control was negatively correlated with hallucinations ( $r = -.276$ ,  $p = .021$ ).

**Table 3.** Comparison of Mean Scores for the State-Trait Anger Expression Inventory and Its Subscales According to the Disease Characteristics of the Patients

Variables	Trait Anger ( $\bar{X} \pm SD$ )	Anger-In ( $\bar{X} \pm SD$ )	Anger-Out ( $\bar{X} \pm SD$ )	Anger Control ( $\bar{X} \pm SD$ )	Test/p
<b>Age of Onset of Disease</b>					
Under 20 years	26.41 ± 5.74	21.00 ± 3.36	21.66 ± 5.79	17.54 ± 4.46	KW = 0.180; p = 0.836
21–30 years	25.53 ± 5.51	20.50 ± 2.76	21.00 ± 5.33	17.57 ± 3.90	
31 years and above	25.70 ± 4.88	21.95 ± 1.63	21.85 ± 4.79	17.70 ± 3.16	
<b>Duration of Disease</b>					
Less than 10 years	26.07 ± 4.94	22.00 ± 2.35	21.78 ± 4.75	17.21 ± 2.99	KW = 3.581; p = 0.033
11–20 years	25.51 ± 6.25	20.16 ± 3.12	21.12 ± 6.07	18.45 ± 4.58	
21 years and above	26.45 ± 3.77	21.36 ± 1.80	21.63 ± 4.52	16.18 ± 3.31	
<b>Duration of Remission</b>					
1–12 months	24.96 ± 5.03	21.06 ± 3.12	21.33 ± 5.36	17.83 ± 4.04	KW = 1.318; p = 0.274
13–36 months	27.29 ± 4.58	21.41 ± 1.83	22.00 ± 4.58	17.04 ± 2.54	
37 months and above	25.50 ± 6.79	20.62 ± 3.24	21.12 ± 6.32	18.00 ± 5.12	
<b>History of Violence</b>					
Present	27.01 ± 4.87	20.86 ± 2.78	22.60 ± 4.91	16.86 ± 3.44	z = 9.422; p = 0.003
Absent	22.84 ± 5.56	21.68 ± 2.66	18.42 ± 5.02	19.57 ± 4.31	
<b>Medication Adherence</b>					
Present	21.58 ± 5.85	20.00 ± 3.66	18.00 ± 6.17	20.16 ± 4.87	z = 10.617; p = 0.002
Absent	26.77 ± 4.84	21.31 ± 2.51	22.18 ± 4.83	17.06 ± 3.43	

**Table 4.** Significant Correlations Between Anger Dimensions and Symptom Domains

Variables	Significant Correlations
Anger-Out	Positive Formal Thought ( $r = .286$ , $p = .016$ )
Anger Control	Hallucinations ( $r = -.276$ , $p = .021$ )
Total Anger Expression Score	Positive Formal Thought ( $r = .259$ , $p = .030$ )

**Table 5.** Effect Sizes (Cohen's  $d$ ) for Differences in Anger Expression by History of Violence

Variable	Cohen's $d$	Effect Size Magnitude
Trait Anger	0.820	Large
Anger-In	-0.301	Medium
Anger-Out	0.841	Large
Anger Control	-0.686	Medium

Note: Cohen's  $d$  values were calculated to evaluate the magnitude of differences in anger expression variables between patients with and without a history of violence. Values of 0.2, 0.5, and 0.8 are typically interpreted as small, medium, and large effect sizes, respectively.

Additionally, the total anger expression score (sum of trait anger, anger-in, anger-out, and anger control subscales) was positively correlated with positive formal thought disorder ( $r = .259$ ,  $p = .030$ ). No significant correlations were found between anger dimensions and negative symptom domains.

These findings underscore the relevance of sociodemographic and clinical variables in shaping anger expression in patients with schizophrenia. The association between externalized anger and positive psychotic symptoms, as well as the impact of violence history and medication adherence on anger profiles, suggests potential intervention points for clinical management. Incorporating anger assessment into routine psychiatric evaluation may support personalized care strategies aimed at improving emotional regulation and reducing risk behaviors.

This table presents the effect sizes (Cohen's  $d$ ) for differences in trait anger, anger-in, anger-out, and anger control between patients with and without a history of violence. Cohen's  $d$  values of 0.2, 0.5, and 0.8 are conventionally interpreted as small, medium, and large effect sizes, respectively. The results indicate that trait anger and anger-out demonstrated large effect sizes, while anger control and anger-in showed medium effects.

## DISCUSSION

This study provides a multidimensional evaluation of anger expression styles among individuals with schizophrenia. In addition to statistically significant group differences, the inclusion of effect size analyses has allowed for a deeper understanding of the clinical relevance of these findings. Most notably, patients with a history of violence demonstrated markedly higher levels of trait anger and anger-out behaviors compared to those without such history. These differences were not only statistically significant but also clinically meaningful, as evidenced by large effect sizes ( $d = 0.82$  and  $d = 0.84$ , respectively). This suggests that trait anger and outward-directed anger are key emotional patterns in individuals prone to violent behavior, consistent with previous studies linking anger dysregulation to aggression in schizophrenia (Gadea et al., 2023; Kristof et al., 2018). The elevated levels of trait anger

in this group may reflect a stable vulnerability toward perceiving interpersonal situations as threatening or unjust, while high anger-out scores may indicate reactive, externally directed coping mechanisms.

Anger control, which exhibited a medium effect size ( $d = -0.69$ ), was lower in the same group, suggesting diminished ability to manage or suppress anger impulses. This aligns with findings from Rzewuska (2002) and Tani et al. (2018), who identified poor anger control as a key factor in impulsivity and aggression among non-adherent patients. Although the difference in anger-in scores showed only a medium effect ( $d = -0.30$ ) and was not statistically significant, it still warrants attention given its association with emotional suppression and risk for depressive comorbidity (Yılmaz et al., 2023). From a clinical perspective, these findings highlight the importance of not only identifying statistically significant differences, but also interpreting their real-world impact through effect size estimates. The large effect sizes in key domains suggest that anger regulation difficulties are not incidental, but central to the emotional and behavioral profile of high-risk patients with schizophrenia.

Sociodemographic variables also played a significant role in shaping anger expression. Unemployed patients and those living in extended families had higher anger-out scores, potentially due to increased psychosocial stress, reduced autonomy, and interpersonal conflict (Ergin et al., 2006; Fassino et al., 2023). These contextual stressors may interact with illness-related vulnerabilities to produce maladaptive emotional responses. Gender differences were again pronounced: while men were more likely to externalize anger (anger-out), women internalized it (anger-in), consistent with culturally embedded patterns of gendered emotion regulation (Kaya et al., 2007; Özmen et al., 2016). Each subdimension of anger expression has distinct implications for clinical risk and treatment planning. Anger-out is often observable and may be managed through behavioral techniques and de-escalation strategies. In contrast, anger-in may go unnoticed but still exert a deleterious effect on the patient's internal psychological state, requiring therapeutic exploration. Trait anger and impaired anger control



are transdiagnostic markers of emotional dysregulation and should be routinely screened in patients with schizophrenia. Taken together, these findings highlight the need for anger expression styles to be conceptualized not as a unitary construct but as a multidimensional emotional process influenced by illness severity, cognitive disorganization, treatment engagement, and sociocultural context. Integration of anger-focused assessment and intervention into psychiatric care may improve emotional resilience, reduce the risk of aggression or self-harm, and enhance overall clinical outcomes.

### Limitations

Several limitations should be considered in interpreting the findings of this study. First, the sample size was relatively small ( $n = 70$ ), which may limit statistical power and the generalizability of the results. Future studies should consider conducting power analyses to determine adequate sample size. Second, the study was conducted with inpatients from a single clinical setting, limiting external validity. Comparative studies with community-based samples would allow for broader clinical inferences. Third, although appropriate non-parametric tests were used, effect size metrics (e.g.,  $r$ , Cohen's  $d$ ) were not systematically reported in previous literature, though included here. Future work should continue to integrate these metrics to enhance interpretability.

### CONCLUSION

This study demonstrates that anger expression styles in patients with schizophrenia are significantly influenced by both clinical and sociodemographic factors. Positive symptoms such as hallucinations and formal thought disorder are associated with higher levels of outward-directed anger and diminished anger control. Additionally, patients with a history of violence or poor medication adherence tend to experience more difficulties in regulating anger. Sociodemographic variables such as gender, employment status, and family structure also affect how anger is expressed. These results highlight the importance of routinely assessing anger expression patterns in psychiatric practice. Implementing

targeted psychosocial interventions—including emotion regulation training and medication adherence support—may help improve clinical outcomes by promoting healthier anger management and reducing the risk of aggression or self-harm among individuals with schizophrenia.

### Conflict of Interest

The authors declare that they have no conflict of interest.

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