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Original Research Article

EMOTIONAL REGULATION, IMPULSIVITY, AND AGGRESSION IN SCHIZOPHRENIA PATIENTS: A CROSS-SECTIONAL STUDY

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ABSTRACT

Background: Schizophrenia is a chronic psychiatric disorder characterized by disturbances in thought, perception, emotion, and behavior. Emotional dysregulation, impulsivity, and aggression are common clinical features that adversely affect functional outcomes, treatment adherence, and quality of life. This study aimed to evaluate the relationship between emotional dysregulation, impulsivity, aggression, and symptom severity among patients with schizophrenia.

Materials and Methods: A hospital-based cross-sectional study was conducted among patients diagnosed with schizophrenia attending the Department of Psychiatry at PES Institute of Medical Sciences and Research, Kuppam. Sociodemographic and clinical data were collected using a structured proforma. Symptom severity was assessed using the Positive and Negative Syndrome Scale (PANSS), emotional dysregulation using the Difficulties in Emotion Regulation Scale (DERS), impulsivity using the Barratt Impulsiveness Scale-11 (BIS-11), and aggression using the Buss–Perry Aggression Questionnaire (BPAQ). Pearson's correlation analysis was performed to examine relationships between study variables.

Results: The paranoid subtype was the predominant form of schizophrenia, accounting for 82.5% of cases, with no significant association between schizophrenia subtype and sociodemographic characteristics. The mean age at illness onset was 33.10 ± 11.75 years, while the mean PANSS, DERS, BIS-11, and BPAQ scores were 73.29 ± 23.27, 90.64 ± 13.24, 71.16 ± 13.32, and 69.60 ± 10.99, respectively. Significant positive correlations were observed between PANSS scores and DERS ($r=0.86$), BIS-11 ($r=0.81$), and BPAQ ($r=0.72$) (all $p<0.0001$). Emotional dysregulation demonstrated the strongest correlation with impulsivity ($r=0.92$, $p<0.0001$), while both positive and negative symptom scores showed significant associations with emotional dysregulation, impulsivity, and aggression.

Conclusion: Patients with schizophrenia demonstrated substantial emotional dysregulation, impulsivity, and aggression, all of which were strongly associated with symptom severity. The close relationship among these psychological domains suggests that comprehensive management strategies targeting emotional regulation, impulsive behavior, and aggression, in addition to psychotic symptoms, may improve overall clinical outcomes in schizophrenia.

Keywords: Schizophrenia; Emotional Dysregulation; Impulsivity; Aggression; Positive and Negative Syndrome Scale; Difficulties in Emotion Regulation Scale.

INTRODUCTION

In recent years, there has been a growing emphasis on understanding how emotional processes influence the onset and course of psychiatric disorders. Rather than concentrating solely on diagnostic categories and symptom groupings, mental health research increasingly investigates the core psychological processes that drive maladaptive behaviours. Among these, emotion regulation has become recognized as a vital factor affecting mental health outcomes.[1]

Emotion regulation encompasses the strategies individuals employ to manage and respond to both pleasant and unpleasant emotions. Difficulties in regulating emotions—especially when faced with stress or triggering situations—can lead to what is known as emotional dysregulation.[2] This state is marked by excessive emotional reactivity, poor impulse control, and challenges in returning to an emotional baseline. Core features include reduced emotional awareness, difficulty accepting emotions, impulsive behaviours during distress, and diminished ability to pursue goal-directed actions despite emotional turmoil.[3]

In schizophrenia, emotional dysregulation is frequently observed as unexplained disturbances in expressing, perceiving, and experiencing emotions. This has been described as the "paradox of emotion," where individuals may seem emotionally disengaged or unresponsive externally while suffering from intense emotional distress internally. Research suggests that both positive symptoms (such as delusions and hallucinations) and negative symptoms (including diminished emotional expression and lack of motivation) are associated with problems in emotional processing and regulation.[4]

Impulsivity, defined as the propensity to act rapidly without thoughtful consideration of potential consequences, is also common in schizophrenia. It manifests as difficulty inhibiting spontaneous behaviours, suboptimal decision-making, and an inability to delay gratification. Such impulsivity can result in detrimental actions affecting the individual's social life, work, and clinical outlook. Neurobiological dysfunction, particularly in brain regions involved in executive control, alongside emotional dysregulation, appears to elevate impulsivity in these patients. Persistent impulsiveness further raises the risk of self-harm, substance misuse, and exacerbation of psychiatric symptoms.[5]

Aggression, which consists of actions intended to inflict harm or express hostility (ranging from verbal threats to physical acts), can be divided into reactive forms—triggered by perceived provocation or frustration—and proactive, goal-oriented forms. In the context of schizophrenia, aggression is frequently tied to positive symptoms like paranoia, breakdowns in emotion regulation, and environmental pressures. Aggressive behaviour complicates clinical care as it impacts prognosis, social adjustment, and safety, often resulting in increased hospitalizations. Importantly, aggression is not universal among those with schizophrenia but arises from a complex interplay of neurobiological, psychological, and social influences.[6]

Given the relative lack of research examining these variables in Indian populations, the present study aims to evaluate the extent of emotion regulation difficulties, impulsivity, and aggression in individuals diagnosed with schizophrenia. It also seeks to elucidate the connections among these factors to guide more specialized interventions and enhance recovery-based mental health care.

Aims and Objectives

1. To assess the levels of emotional regulation, impulsivity, and aggression in patients with schizophrenia.
2. To correlate emotional regulation, impulsivity, and aggression with clinical variables of patients with schizophrenia.

MATERIALS AND METHODS

This cross-sectional study was conducted over a span of 18 months in rural areas of Chittoor District, Andhra Pradesh. Participants were recruited from the Psychiatry Outpatient Department (OPD) at PESIMSR, Kuppam. Individuals diagnosed with schizophrenia based on ICD-10 diagnostic criteria were included in the study. A purposive sampling technique was utilized, yielding a final sample of 80 participants, Calculated from Tunc & Gul et al, 2023 (7)

Inclusion and exclusion criteria:

Inclusion Criteria

1. Patients aged 18–60 years
2. Diagnosis of schizophrenia according to ICD-10 criteria
3. Able and willing to provide informed consent

Exclusion Criteria

1. Presence of comorbid major psychiatric disorders (e.g., bipolar disorder) or substance use disorders
2. History of intellectual disability or neurological disorders
3. Severe medical illness interfering with assessment

Study Instruments

1. **Sociodemographic Characteristics**: The study incorporates basic demographic data such as age, gender, level of education, marital status, employment status, type of family system, and housing situation.

2. **Clinical Factors**: Clinical information collected includes the length of illness, age when symptoms first appeared, the severity of symptoms (using scales like PANSS and SANS), and the specific type of schizophrenia diagnosed.

3. **Positive and Negative Syndrome Scale (PANSS)**: The PANSS (Kay et al., 1987) was used to assess both positive and negative symptoms of schizophrenia as well as general psychopathology. It is a "gold standard." Each item is rated from 1 ("absence of psychopathology") to 7 ("extremely severe"). The PANSS includes 30 items, with 7 in the Positive Scale, 7 in the Negative Scale, and 16 in the General Psychopathology Scale. The composite score, obtained by subtracting the negative score from the positive score, indicates the degree of predominance of one syndrome over the other. Sensitivity was 0.92 and specificity was 0.75.[8]

3. **Difficulties in Emotion Regulation Scale (DERS)**: Developed by Gratz and Roemer in 2004, the DERS is a 36-item self-report instrument that evaluates significant challenges in emotional regulation. Responses are captured on a 5-point Likert scale (ranging from 1 – 'rarely' to 5 – 'almost always'), with higher scores signifying more pronounced difficulties. It measures six critical aspects: nonacceptance of emotional responses, difficulties with goal-directed action when distressed, problems with impulse control, reduced emotional awareness, limited strategies for effective emotion regulation, and unclear understanding of emotions. The original is validated for use in Indian adolescents and adults, with the DERS-SF demonstrating robust internal consistency (Cronbach's alpha around 0.86). (9)

4. **Barratt Impulsiveness Scale (BIS-11)**: Created by Patton, Stanford, and Barratt in 1995, the BIS-11 is a widely recognized tool to assess impulsiveness. It contains 30 items evaluated on a 4-point Likert scale, targeting three key dimensions: attentional impulsivity, motor impulsivity, and non-planning impulsivity. Higher scores point to greater impulsiveness. The BIS-11 has a validated Hindi version and an adolescent adaptation (BIS-11A); initial research supports their cultural suitability for Indian populations.[10]

5. **Buss–Perry Aggression Questionnaire (BPAQ)**: Originally designed by Buss and Durkee in 1957 and later revised by Buss and Perry in 1992, the BPAQ measures different types of aggressive behaviors across four areas: physical aggression, verbal aggression, anger, and hostility. The questionnaire includes 29 items, each on a 5-point Likert scale, with higher scores indicating stronger aggressive tendencies. Both Hindi and other regional language versions have been translated and validated for Indian populations. Research confirms the translated questionnaires are reliable, matching the English versions in performance and showing no notable differences across genders or demographic groups.[11]

Informed consent was obtained, and confidentiality was maintained for all participants. The study received approval from the Institutional Ethics Committee.

Statistical Analysis

Data were entered into Microsoft Excel and analyzed using SPSS (Statistical Package for the Social Sciences). Categorical variables were expressed as frequencies and percentages and visualized through bar charts and pie diagrams. Continuous variables were analyzed using Mean and standard deviations. Group comparisons were conducted using the Chi-square test for categorical variables and the independent samples t-test for continuous variables. A p-value of < 0.05 was considered statistically significant.

RESULTS

Table 1: Distribution of Schizophrenia Subtypes across Sociodemographic Variables

Variable	Category	Paranoid	Residual	Undifferentiated	Catatonic	χ^2	p-value
Age Group	<20	6	1	0	1	4.12	0.991
	21-30	15	1	2	1		
	31-40	15	0	1	0		
	41-50	23	2	1	2		
	51-60	11	1	1	0		
	>60	4	0	0	0		
Gender	Male	43	5	3	1	0.40	0.937
	Female	23	0	2	3		
Education Level	Illiterate	13	3	1	1	2.62	0.623
	Primary	17	2	0	0		
	Secondary	19	0	0	0		
	High School	14	0	1	0		
	Graduate & Above	3	0	3	3		
Marital Status	Married	33	3	3	2	3.07	0.383
	Unmarried	23	2	0	0		
	Divorced/ Separated/ Widow	10	0	2	2		
Occupation	Unskilled	26	2	1	1	5.50	0.239
	Unemployed	25	1	1	0		
	Skilled	10	1	2	1		
	Semiskilled	5	1	1	2		
Family Type	Nuclear	41	4	3	3	3.06	0.382

	Joint	17	1	2	0		
	Extended	8	0	0	1		
Residence	Rural	51	5	5	2	1.62	0.654
	Semiurban	15	0	0	2		
***P<0.05 is statistically significant; **P<0.01 is statistically highly significant**							

Table 1 summarizes the distribution of schizophrenia subtypes according to sociodemographic characteristics. The paranoid subtype was the most common diagnosis across all demographic categories. Most patients were aged 21–50 years, with the highest frequency observed in the 41–50-year age group. Males constituted the majority of the study population, particularly among patients with the paranoid subtype. Most participants had primary to high school education, were married, belonged to nuclear families, resided in rural areas, and were either unskilled workers or unemployed.

Chi-square analysis demonstrated no statistically significant association between schizophrenia subtype and age group ($\chi^2 = 4.12$, $p = 0.991$), gender ($\chi^2 = 0.40$, $p = 0.937$), educational status ($\chi^2 = 2.62$, $p = 0.623$), marital status ($\chi^2 = 3.07$, $p = 0.383$), occupation ($\chi^2 = 5.50$, $p = 0.239$), family type ($\chi^2 = 3.06$, $p = 0.382$), or place of residence ($\chi^2 = 1.62$, $p = 0.654$), indicating that schizophrenia subtype was independent of the evaluated sociodemographic variables.

Table 2: Clinical and Psychometric Profile of Patients with Schizophrenia (Mean ± SD)

Variable	Mean ± SD
Age at Onset of illness	33.10 ± 11.75
PANSS Score	73.29 ± 23.27
DERS (Emotional Regulation)	90.64 ± 13.24
BIS 11 (Impulsivity)	71.16 ± 13.32
BPAQ (Aggression)	69.60 ± 10.99

Table 2 presents the clinical and psychometric profile of the study participants. The mean age at onset of illness was 33.10 ± 11.75 years. Participants demonstrated a mean PANSS score of 73.29 ± 23.27, indicating moderate symptom severity. Difficulties in emotion regulation were reflected by a mean DERS score of 90.64 ± 13.24, while the mean BIS-11 score of 71.16 ± 13.32 suggested considerable impulsivity. The mean BPAQ score of 69.60 ± 10.99 indicated elevated aggression levels among the study population.

Table 3: Correlation Matrix Among Symptom Severity, Emotional Regulation, Impulsivity, and Aggression Measures in Schizophrenia Patients

Variable	PANSS	DERS	BIS 11	BPAQ
PANSS	1.00	0.86 ($p < 0.0001$) **	0.81 ($p < 0.0001$) **	0.72 ($p < 0.0001$) **
DERS	0.86 ($p < 0.0001$) **	1.00	0.92 ($p < 0.0001$) **	0.81 ($p < 0.0001$) **
BIS 11	0.81 ($p < 0.0001$) **	0.92 ($p < 0.0001$) **	1.00	0.84 ($p < 0.0001$) **
BPAQ	0.72 ($p < 0.0001$) **	0.81 ($p < 0.0001$) **	0.84 ($p < 0.0001$) **	1.00
*P<0.05 is statistically significant; **P<0.01 is statistically highly significant				

Pearson's correlation analysis demonstrated strong positive correlations among all study variables (Table 3). Total PANSS score showed a strong positive correlation with emotional dysregulation (DERS; $r = 0.86$, $p < 0.0001$), impulsivity (BIS-11; $r = 0.81$, $p < 0.0001$), and aggression (BPAQ; $r = 0.72$, $p < 0.0001$). Emotional dysregulation exhibited the strongest association with impulsivity ($r = 0.92$, $p < 0.0001$), while impulsivity was also strongly correlated with aggression ($r = 0.84$, $p < 0.0001$). These findings indicate that greater symptom severity is accompanied by higher levels of emotional dysregulation, impulsive behaviour, and aggression.

Table 4: Correlations between PANSS Subscales (Positive, Negative) and Psychological Variables (DERS, BIS-11, BPAQ)

Variable	DERS	BIS-11	BPAQ
Positive	0.53($p < 0.0001$) **	0.51($p < 0.0001$) **	0.53($p < 0.0001$) **
Negative	0.64($p < 0.0001$) **	0.61($p < 0.0001$) **	0.65($p < 0.0001$) **

Correlation analysis of PANSS subscales demonstrated significant positive associations with emotional dysregulation, impulsivity, and aggression (Table 4). Positive symptom scores showed moderate positive correlations with DERS ($r = 0.53$, $p < 0.0001$), BIS-11 ($r = 0.51$, $p < 0.0001$), and BPAQ ($r = 0.53$, $p < 0.0001$). Negative symptom scores demonstrated comparatively

stronger correlations with DERS ($r = 0.64$, $p < 0.0001$), BIS-11 ($r = 0.61$, $p < 0.0001$), and BPAQ ($r = 0.65$, $p < 0.0001$). Overall, greater severity of both positive and negative symptoms was significantly associated with increased emotional dysregulation, impulsivity, and aggression, with negative symptoms exhibiting relatively stronger relationships.

DISCUSSION

The present study investigated the relationship between schizophrenia symptom severity, emotional dysregulation, impulsivity, and aggression among clinically diagnosed patients with schizophrenia. The paranoid subtype was the predominant clinical presentation, accounting for 82.5% of cases, while residual, undifferentiated, and catatonic schizophrenia were relatively uncommon. No significant associations were observed between schizophrenia subtypes and sociodemographic characteristics, including age, gender, educational status, marital status, occupation, family type, and place of residence. Participants demonstrated moderate symptom severity, with a mean PANSS score of 73.29 ± 23.27, alongside elevated scores for emotional dysregulation (DERS: 90.64 ± 13.24), impulsivity (BIS-11: 71.16 ± 13.32), and aggression (BPAQ: 69.60 ± 10.99). Strong positive correlations were observed between symptom severity and emotional dysregulation ($r=0.86$), impulsivity ($r=0.81$), and aggression ($r=0.72$), while emotional dysregulation exhibited the strongest correlation with impulsivity ($r=0.92$), indicating a close interrelationship among these psychological constructs.

The predominance of the paranoid subtype observed in the present study is consistent with previous epidemiological studies reporting paranoid schizophrenia as the most frequently diagnosed subtype in clinical settings. Furthermore, the absence of significant associations between schizophrenia subtype and sociodemographic variables is in agreement with the findings of Peralta and Cuesta,[12] who reported considerable overlap in demographic characteristics across schizophrenia subtypes despite minor differences in clinical presentation. These observations suggest that sociodemographic characteristics alone are unlikely to distinguish schizophrenia subtypes in routine clinical practice.

Patients in the present study demonstrated substantial impairments in emotional regulation, impulsivity, and aggression, consistent with previous literature describing these psychological domains as core contributors to functional impairment in schizophrenia. Henry et al,[13] Hoptman et al,[14] and Swann,[15] similarly reported that patients with schizophrenia exhibit marked emotional dysregulation, impaired impulse control, and increased aggressive behaviour compared with healthy individuals. The elevated mean DERS, BIS-11, and BPAQ scores observed in the present study further support the presence of widespread deficits in emotional and behavioural regulation within this population.

A major finding of the present study was the strong positive association between overall symptom severity and emotional dysregulation. PANSS scores demonstrated a strong correlation with DERS scores ($r=0.86$, $p<0.0001$), suggesting that greater psychopathology is associated with increasing difficulty in regulating emotional responses. These findings are consistent with Kimhy et al,[16] who demonstrated that impaired emotion regulation contributes to poorer psychosocial functioning, greater symptom burden, and reduced quality of life among individuals with schizophrenia. Emotional dysregulation may therefore represent an important therapeutic target capable of improving both clinical and functional outcomes.

Similarly, impulsivity showed a strong positive association with schizophrenia severity. Higher PANSS scores were significantly associated with increased BIS-11 scores ($r=0.81$, $p<0.0001$), supporting previous evidence that impulsive behaviour contributes to adverse clinical outcomes, including poor treatment adherence, substance misuse, suicidal behaviour, and violence. Elbogen and Johnson,[17] also reported that impulsivity is an important determinant of violent behaviour among individuals with serious mental illness, emphasizing the importance of early identification and behavioural intervention.

Aggression demonstrated significant positive correlations with both PANSS and impulsivity scores, supporting the concept that aggressive behaviour in schizophrenia is multifactorial and closely linked to symptom severity and behavioural dyscontrol. Similar observations were reported by Swanson et al,[18] who identified psychotic symptoms and impulsive traits as important contributors to aggressive behaviour among individuals with schizophrenia. The elevated BPAQ scores observed in the present study therefore reinforce the need for routine assessment of aggression as part of comprehensive psychiatric evaluation.

Analysis of PANSS subscales further demonstrated that both positive and negative symptoms were significantly associated with emotional dysregulation, impulsivity, and aggression, with negative symptoms showing comparatively stronger correlations ($r=0.61–0.65$). This finding suggests that behavioural dysregulation may be more closely linked to persistent negative symptoms than to acute positive psychotic symptoms. Similar observations have been reported by Gao et al,[19] who proposed that impaired emotional control contributes to impulsive behaviour, which subsequently increases the likelihood of aggression. These findings support theoretical models proposing that emotional dysregulation acts as an intermediary mechanism

linking schizophrenia symptoms with behavioural disturbances.

The present findings are also supported by more recent evidence examining emotional regulation and impulsivity across psychotic disorders. Vines et al,[20] reported that deficits in emotion regulation are closely associated with impulsive behaviour and represent potential targets for psychosocial intervention. Likewise, a meta-analysis by Bresin,[ss] demonstrated that impulsivity dimensions, particularly urgency and lack of premeditation, are strongly associated with aggressive behaviour across psychiatric populations. Together with the present findings, these studies suggest that emotional dysregulation may underlie impulsive tendencies that subsequently manifest as aggressive behaviour, highlighting the importance of integrated behavioural interventions in schizophrenia management.

Overall, the present study extends existing evidence by demonstrating strong interrelationships among schizophrenia symptom severity, emotional dysregulation, impulsivity, and aggression within a clinically diagnosed population. These findings reinforce the need for multidimensional assessment and management strategies that address not only psychotic symptoms but also the behavioural and emotional disturbances that substantially influence long-term functional outcomes.

Limitations

The findings of this study should be interpreted in light of certain limitations. First, the cross-sectional design precludes establishing causal relationships between schizophrenia symptom severity, emotional dysregulation, impulsivity, and aggression. Second, the study was conducted at a single tertiary care centre with a relatively modest sample size, which may limit the generalizability of the findings. Third, psychological variables were assessed using self-report instruments that are susceptible to recall and response bias. In addition, potentially important confounding factors, including medication status, duration of untreated psychosis, cognitive functioning, and psychiatric comorbidities, were not evaluated. Future multicentre longitudinal studies with larger sample sizes are required to clarify temporal relationships and determine whether interventions targeting emotional regulation and impulsivity improve clinical outcomes in schizophrenia.

CONCLUSION

The present study demonstrated that the paranoid subtype was the predominant clinical subtype of schizophrenia, with no significant association between schizophrenia subtype and sociodemographic characteristics. Patients exhibited moderate symptom severity accompanied by substantial emotional dysregulation, impulsivity, and aggression. Strong positive correlations between PANSS scores and psychological measures, particularly the close association between emotional dysregulation and impulsivity, underscore the complex interplay between psychopathology and behavioural dysfunction in schizophrenia. These findings support the incorporation of interventions targeting emotion regulation, impulsivity, and aggression alongside conventional antipsychotic treatment to promote better clinical and functional outcomes in individuals with schizophrenia.

Ethical Approval

The study was approved by the Institutional Ethics Committee of PESIMSR, kuppam, and written informed consent was obtained from all participants prior to enrolment in the study.

Disclosures

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