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Effect of psycho-educational program on positive, negative symptoms and impulsivity among schizophrenic patients

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Abstract
Background: Schizophrenia is a severe mental disorder that influences a person's perceptions, thoughts, and actions.
Aim: The study aimed to evaluate the effect of psycho-educational program on positive negative symptoms and impulsivity among schizophrenic patients.
Study design: A quasi-experimental research design was used.
Setting: This study was conducted at Minia Psychiatric Health and Addiction Treatment Hospital.
Subject: A purposive sample of 40 patients diagnosed with schizophrenia had been included in the study as a study group and 40 patients as the control group.
Tools: The first tool is an interviewing questionnaire to collect socio-demographic and clinical data questionnaire, and the second tool is the Positive and Negative Syndrome Scale (PANSS), which is a rating scale used to assess the positive and negative symptoms of schizophrenia; the third tool is Barrat Impulsivity Scale to assess impulse-control disorder or pathological impulsivity.
Results: Less than a fifth of studied patients had low positive and negative syndrome compared to all at post-test and the majority at follow-up. Also, the minority of the studied patients had low impulsivity compared to all at post-test and the majority at follow up. There was a positive correlation between the positive-negative syndrome and impulsivity.
Conclusion: There was a significant improvement in the studied patient's positive and negative symptoms and in the level of impulsivity in the post-psycho-educational program compared to pre-psycho-educational.
Recommendations: Continuous provision of psycho-educational program should be developed in all psychiatric departments and social contexts to improve learning skills, maintain the improvement in social functioning among persons with schizophrenia, and decrease positive and negative symptoms. Continuous provision of physical activity to decrease impulsivity.

Keywords: Positive symptoms, negative symptoms, impulsivity, psycho-educational, schizophrenic patients

Introduction

Psychologists view humans as a holistic entity consisting of biological, psychological, and social aspects, constantly undergoing dynamic adaptive changes. Psychological disorders have the potential to disrupt this adaptive state. Schizophrenia is a disruptive disorder that impacts approximately 1% of the population with psychotic disorders. This disorder is highly incapacitating and has a profound impact on personal, social, and professional functioning [1]. Schizophrenia is widely recognized as the prevailing form of chronic psychosis in Egypt, constituting the majority of individuals admitted to mental hospitals. The estimated prevalence of schizophrenia in Egypt is approximately 22% of the population, corresponding to around 56 thousand individuals. Schizophrenia symptoms are classified into two main categories: positive or hard symptoms/signs, encompassing delusions, hallucinations, and severely disorganized thinking, speech, and behavior; and negative symptoms/signs, comprising flat affect, lack of volition, and social withdrawal or discomfort [2].

Schizophrenia is a manageable condition, and there have been significant advancements in antipsychotic treatment. Traditional therapies primarily rely on the administration of psychotropic medication, which effectively controls psychiatric symptoms but does not provide the necessary conditions for sustained control of negative symptoms in the long

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term. Medication can manage the positive symptoms; however, the negative symptoms often persist even after the positive symptoms have subsided. The enduring nature of these adverse symptoms over time poses a significant obstacle to the patient's recuperation and enhanced performance in their everyday activities [3].

The symptoms of schizophrenia can vary among individuals, but they typically encompass three primary categories: positive, negative, and cognitive. The symptoms of schizophrenia can be categorized as positive or negative. Positive symptoms refer to an excess of normal experiences, such as hallucinations or delusions. Positive symptoms refer to exaggerated ideas, perceptions, or actions that indicate an individual's inability to distinguish between reality and non-reality. The term "positive" refers to the existence of symptoms as opposed to their absence. The negative symptoms are characterized by reduced experiences or expression [4].

Negative symptoms result in the lack of emotional response (blunted affect), the absence of motivation and enjoyment from activities, and a total loss of voluntary drive. This leads to apathy towards the external world, and the patient's exhibit apathy towards themselves, including their physical well-being. Consequently, they experience reduced sensitivity to pain, exhibit poor hygiene, and, in severe instances, may become incapable of self-feeding [5]. Furthermore, individuals diagnosed with schizophrenia commonly exhibit elevated levels of self-reported impulsivity. However, the results from performance-based risk-taking tasks are inconsistent, as patients may display risk aversion or a lack of impulsivity. At the same time, they may exhibit an increase in impulsive risk-taking behavior. Non-optimal risk decisions in schizophrenia can be attributed to various factors such as cognitive deficits, impaired mental representations of reward, negative symptoms, and abnormalities in reward learning [6].

These phenomena can lead to harmful behaviors, including violence, and thus represent a serious public health concern. Acts of violence frequently serve as grounds for psychiatric hospitalization, resulting in extended periods of confinement, distress for both patients and their victims, and heightened social marginalization. Despite the attention paid to violence, little is understood about its neural basis in schizophrenia. On a psychological level, aggression in schizophrenia has been primarily attributed to psychotic symptoms, desires for instrumental gain, or impulsive responses to perceived personal slights [7]. Various forms of impulsivity are elevated in disorders across the psychosis spectrum, including bipolar disorder, schizoaffective disorder, and schizophrenia. It appears to exacerbate morbidity in these disorders, as impulsivity has been associated with increases in the risks for violence, substance abuse, more intensive hospital courses, and suicide attempts. Impulsivity has also been used to guide treatment and is an important factor when selecting appropriate medication regimens [8].

Recovery from schizophrenia is a gradual process that is unique to each person. The symptoms typically ease and become more manageable with time, although they may not completely vanish. The treatment of schizophrenia is enhanced by adopting a recovery-oriented approach that emphasizes the principles of hope, empowerment, and optimism. The illness can typically be effectively controlled through medications and psychosocial interventions, such as psychotherapy, education, and peer support [9]. The psycho-educational intervention is a structured and systematic approach that combines supportive and cognitive behavior therapy techniques, focusing on addressing the needs of patients and their families. The intervention aims to enhance patient and family understanding of the disease, improve adaptation to illness, promote effective communication, and facilitate problem-solving abilities. Nurses must assume a crucial role in implementing psychological and educational therapies with patients diagnosed with schizophrenia, as they can reap numerous advantages from participating in creative group sessions facilitated by psychiatric nurses. Psychiatric education incorporates emotional components and empowers patients and their family members to manage the illness [10].

Nurses play a significant role in enhancing the quality of life for patients with schizophrenia. The compassionate nature of nursing extends not only to the patients themselves but also to their families. Nurses assist families in coping with treatment's physical and psychological effects, adapting to the stressors they encounter, caring for sick relatives, and identifying any abnormal behavior. The ability of nurses to provide necessary support, information, and adjustment can impact the quality of life for both patients and their families [5].

Significance of the study

Among men, schizophrenia is the fifth most prevalent cause of disability, while among women, it ranks sixth. The global occurrence of schizophrenia varies across different regions and in contrast to its prevalence, which appears to be lower in developing nations compared to developed nations. The global prevalence of schizophrenia, as determined by published epidemiological studies and lifetime prevalence data, is estimated to be 4.6 per 1000 individuals, equivalent to 0.46% (5). Furthermore, schizophrenia is the predominant psychiatric disorder in Egypt, with a prevalence of 15 cases per 10,000 individuals [11]. In this respect, Harvey et al., [12] reported that 75% of patients with schizophrenia complained of impulsivity. The severity of positive and negative symptoms in schizophrenia has consistently been associated with poorer functional outcomes in various domains, including impaired occupational and academic performance, household integration, social functioning, participation in activities, and functional abilities. According to a study conducted by Yilmaz et al. [13], individuals diagnosed with schizophrenia experienced notable enhancements in both their positive and negative symptoms after undergoing psycho-educational therapy. According to Young [14], a study found that 92% of patients with schizophrenia experienced a decrease in impulsivity after participating in a psycho-educational program compared to before the program. Implementing a nursing educational program focused on positive and negative symptoms, as well as impulsivity, in schizophrenic patients is a practical approach to enhancing patient's understanding of their condition and diminishing the severity of these symptoms. Additionally, it aims to mitigate the overall impact of the disease.

Aim of the study

The current study aimed to evaluate the effect of psycho-educational program on positive negative symptoms and impulsivity among Schizophrenic patients.

Research hypotheses

H₁: Positive and negative symptoms will be improved after applying the psycho-educational program in the study group more than in the control group.

H₂: The impulsivity level will be decreased after applying the psycho educational program in the study group more than control group.

Subjects and Method

Research design

A quasi-experimental research design was used to achieve the aim of the study.

Setting

This study was conducted at the Mental Health and Addiction Treatment Hospital in New Minia City, affiliated with the Ministry of Health. The hospital involves two grounds: the outpatient clinics, the pharmacy, and the female inpatient unit, all are in the first ground. The second ground includes the administration office, the substance uses treatment department, and two male psychiatric inpatient units. The capacity of this hospital is 53 beds for both sexes, serving the whole Minia governorate.

Subjects

Eighty male and female inpatients with psychiatric disorders were part of the study; forty patients served as the study group and forty as the control group, with the sample size ranging from ten to thirty percent of the total population [15]. In 2020, the hospital admitted a total of three hundred patients.

Tool 1: Interviewing questionnaire

The researcher created it to evaluate mental patients' socio-demographic and medical data. It included questions about the patient's age, gender, place of residence, education level, marital status, occupation, length of illness, and admission way.

Tool 2: Positive and Negative Syndrome Scale (PANSS)

Schizophrenia symptoms can be evaluated using the Positive and Negative Syndrome Scale (PANSS) [16], which is a 30-item rating scale. The researcher converted the scale from a one-to-seven to a one-to-four scoring system. A score of 1 indicates no presence, and a score of 4 indicates severe presence for each item. With a possible range of 30–120, the PANSS total score is the sum of the 30 items.

Tool 3: Barrat Impulsivity Scale

The Barrat Impulsivity Scale was created by Barratt [17] during the year 1985. This form asks the researcher to fill out 30 questions. An impulse-control disorder or pathological impulsivity may be present, and the severity of this condition can be determined by administering this questionnaire. We assign a point value of 4 to each of the 30 items. The researchers used a 4-point Likert scale where one was for very seldom, 2 for sometimes, 3 for often, and 4 for almost always to collect data from their subjects. With the scores in items (2, 4, 11, 20, 21, 22, 23, 24, 26, 30) reversed. The inquiries are about an individual's thoughts and actions as they pertain to a particular moment in time. Each respondent must indicate their motor, planning, and attention impulsivity level on the questionnaire. Points

ranging from 70 to 75 indicate pathological impulsivity.

Ethical Consideration

The "Research Ethical Committee" of Minia University's Faculty of Nursing provided written initial approval. Because the study adhered to standard clinical ethical guidelines, patients were protected during data collection, and the patients and the hospital's patient rights committee gave their informed verbal and written consent, there was no danger to the patients in the study. The data was coded to ensure privacy and confidentiality, and patients were allowed to refuse participation in the study without explanation. The director of the general loyalty for mental health and addiction treatment in Cairo city approved the study.

Validity of tools

A panel of five psychiatric and mental health nursing experts from Minia and Assiut University reviewed the study's instruments for content validity and recommended any necessary revisions. Research tools were reviewed by experts and translated into Arabic by the researcher to make them clearer and more specific to the culture.

Reliability of tools

The study's scales were evaluated for internal consistency using Cronbach's alpha coefficients test. The positive and negative symptoms scale had a value of.937, and the Barrat impulsivity scale was 0.796, indicating excellent reliability.

The educational program

The researcher developed the psycho-educational program based on the relevant literature and the available resources.

The general objective of the program

The overall objective of the developed psycho-educational program was to increase the studied schizophrenic patients' awareness of their mental illness and to decrease positive, negative symptoms and impulsivity levels among the same studied schizophrenic patients.

The specific objectives of the program

After implementing the psycho-educational program the patients would be able to:

- Gain information about schizophrenia,
- Enhance patient awareness about positive and negative symptoms and teach them skills to control them.
- Empower patients with self-control skills to decrease impulsivity.
- Evaluate the effect of the psycho-educational program on patients' positive, negative symptoms and level of impulsivity.

The educational program

The proposed program was conducted through the following phases.

Assessment phase (Early phase)

This phase aimed to assess positive, negative symptoms and impulsivity among schizophrenic patients divided into "studied and controlled groups" Each patient of both group was interviewed to collect the necessary data. Based on the assessment phase, the researcher prepared the program and media in the form of teaching methods such as lectures and

discussions which were reviewed by supervisors. Media used include visual materials such as posters, personal laptops, videos, and booklets.

Planning (preparatory phase)
This phase included preparing for teaching educational program time, which included seven sessions that started at 1 pm and ended at 2.5 pm three times weekly; The days were the following: Sunday, Tuesday, and Thursday. Application of the intended educational program takes 170 sessions approximately six months. Teaching sessions were conducted in the hall of each department on the second floor for men and the hall of the female department in Minia Hospital for mental health and addiction treatment. Various teaching methods and media were included in this program, such as lectures, brief notes, group discussion, modeling, patient-sharing experiences of the patients, videos, pictures, booklets, and role-playing.

Implementation of the program
The researcher divided patients into eight sub-groups; each one included five patients, to enhance communication and interaction, the same program sessions were implemented for each subgroup of them. During the beginning of each session, the researcher welcomed the patients and started by a feedback about the previous session then provided them with a discussion related to the planned activities for the next one.
Throughout the psycho-educational program, instructional techniques include group discussion, modeling, and role-playing. The researcher used different methods of material and reinforcement as bringing food, fruits, nuts, gum, sweets, and other things. At the end of each session, the researcher summarized the content and asked patients if anyone had any questions, confirmed with them the time of the next session, and gave them a session homework assignment. Also, the researcher summarized the previous session to ascertain the extent of the patient's understanding of the exercises that were discussed and reviewed the session's content again. After finishing the program implementation with each group, the second assessment (post-test) was done. The researcher collected data and applied for the program from March 2022 to the end of August 2022.

The program content was as follows
Session 1: Introduction about the session's purpose, time, place, content, and benefits for the patients.
Session 2: Social skills training such as starting a conversation, asking other people questions, listening to others, giving compliments, responding to criticism, asking someone to do something with you, being polite remembering to say "please" and "thank you." Continue along the program sessions.
Session 3: Physical exercises include deep breathing (relaxation training) and warm-up exercises for 10 minutes. To decrease negative symptoms.
Session 4: Muscle strengthening 10-15 minutes (abdominal muscles and large muscles of arms and legs) as a method to decrease impulsivity.
Session 5: Teach the patient the "Distract yourself strategy" to decrease hallucination and delusion and, consequently impulsivity.
Session 6: Teach the patient "Perform a Reality Check" to decrease hallucination and delusion.

Session 7: Complete teaching the patient "Perform a Reality Check" skills to decrease hallucination and delusion.

Evaluation of the program
Evaluation of both the studied and controlled groups of patients' positive and negative symptoms and impulsivity was done three times using the same study tools: firstly, before the program implementation (pre-test), secondly, immediately one week after the implementation of the program (post-test) to test the retention of knowledge and thirdly, one and half month later after program implementation (follow up test) for testing the continuation of the effectiveness of the implemented program and evaluation of controlled group also was done to conclude the difference between studied and controlled patients.

Data collection procedure
- To comprehend the investigated issue and the program's implementation, a literature review was conducted utilizing accessible books, articles, and the Internet.
- The researcher translated the study tools into Arabic and had them reviewed by dissertation advisors for any necessary revisions. Five experts in psychiatric mental health nursing from the nursing faculties of Minia and Assuit Universities evaluated and validated the tools to ensure they were clear, comprehensive, understandable, and applicable to the study's goals. After that, any necessary adjustments were made.
- The study's director at New Minia City's Mental Health and Addiction Treatment Hospital approved its conduct.
- The director of the general loyalty for mental health and addiction treatment in Cairo city approved the study.
- The patients who participated in the study and the hospital's patient rights committee gave verbal consent.
- The researcher assured the patients' privacy and confidentiality while explaining the study's purpose in a one-on-one conversation to gain their consent and voluntary participation.
- After each participant had finished their dinner and taken their medications, the researcher met with them at the hospital three times a day (on Sundays, Tuesdays, and Thursdays) from 1 to 2.5 p.m. between the start of March 2022 and the end of August 2022, the researcher divided the patients under study into eight subgroups, with five patients in each. Over six months, they collected data and ran the program.
- There was a total of seven sessions, with three sessions per week. Each session lasted approximately 1.5 hours and took place in the meeting rooms of the various departments on the first and second floors of the New Minia Psychiatric Health and Addiction Treatment Hospital.
- After implementing the psycho-educational program, the researcher used assessment tools to gather data, including a pre-test, a post-test, and a follow-up test after 1.5 months.

Data statistical analysis
"Statistical Package for the Social Science" (SPSS 26) was used for data collection, coding, classification, presentation, and investigation. Quantitative variables were represented

by means and standard deviations, while descriptive statistics, such as percentages and frequencies, were employed for qualitative variables. The tests for the relationships were conducted using chi-square.

The statistical significance level (P-value) was:

- P-value <0.05 indicated "significant differences."
- P-value <0.001 indicated "highly significant differences."
- P-value <0.0001 indicated "very high significant differences."
- P-value >0.05 indicated "no significant differences.

Results

Table 1: Frequency distribution of socio-demographic data among schizophrenic patients (no =40).

Characteristics	Control (No.=40)		Study (No.=40)	
	No.	%	No.	%
Age				
<20:29	16	40	19	47.5
30:40	15	37.5	9	22.5
>40	9	22.5	12	30
Mean ± SD	31.5+9.33		32.92+10.4	
Gender				
Male	34	85	33	82.5
Female	6	15	7	17.5
Marital status				
Single	23	57.5	25	62.5
Married	16	40	9	22.5
Divorce	1	2.5	5	12.5
Widowed	0	0	1	2.5
Educational level				
Illiterate	10	25	11	27.5
Primary	7	17.5	4	10
Preparatory	3	7.5	7	17.5
Secondary	18	45	12	30
University	2	5	4	10
Post university	0	0	2	5
Occupation				
Don't work	11	27.5	12	30
Work	29	72.5	28	70
Residence				
Rural	37	92.5	37	92.5
Urban	3	7.5	3	7.5

Table (1) shows that (40% & 47.5%) of the controlled and studied patients were aged between <20:29 years, with mean age (31.5+9.33) and (32.92+10.41) years respectively. Regarding gender for both groups, the highest percentage among controlled and studied patients was male (85% & 82.5% respectively). In relation to marital status (57.5% & 62.5%) of them were single for both controlled and studied patients, respectively. In this respect, the same table illustrates that (45% & 30%) of the controlled and studied patients have secondary education, while (72.5% & 70%) were working, respectively.

Table 2: Frequency distribution of clinical data among schizophrenic patients (no =40).

Clinical data	Control (no.=40)		Study (No. = 40)	
	No.	%	No.	%
Duration of diseases				
<1	32	80	26	65
1-3	1	2.5	4	10
>3	7	17.5	10	25
Previous hospitalization				
Yes	20	50	24	60
No	20	50	16	40
Frequency				
One once	13	65	9	37.5
Two twice	2	10	7	29.2
>2	5	25	8	33.3

Table (2) illustrates that the highest percent (80% & 65%) of the controlled and studied patients had the disease for less than one year, respectively, while (50% & 60%) of them were previously admitted to the hospital. In addition, (65% & 37.5%) of them were admitted to the hospital once, respectively.

Table 3: Mean score of positive and negative syndrome among schizophrenic patients (no.40)

Items	Pre-test		Post-test		Follow-Up	
	Control (No.=40)	Study (No.=40)	Control (No.=40)	Study (No.=40)	Control (No.=40)	Study (No.=40)
	Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD
Positive symptoms	19.4± 7.34	20.17± 7.23	11.8± 4.37	8.27± 1.58	9.85±.44	10.95±.60
T-test (p-value)	.542 (.591 NS)		4.8 (0.001**)		1.7 (.089 NS)	
Negative symptoms	16.77 ±5.31	18.65± 5.47	15.5± 5.12	9.5± 2.72	15.1±.799	12.37±.77
T-test (p-value)	1.57 (.123 NS)		6.37 (0.001**)		2.25 (.03*)	
General psychiatric disturbances	37.6± 11.64	38.3± 9.95	28.6± 9.32	17.7± 1.61	25.07± 1.2	21.85±.67
T-test (p-value)	.290 (.773 NS)		7.14 (0.001**)		2.16 (.03 NS)	
Total positive and negative syndrome	74.07± 20.9	77.2± 18.2	55.97± 14.71	35.57± 4.33	50.07± 1.9	45.17± 1.5
T-test (p-value)	.746 (.460 NS)		8.39 (0.001**)		1.85 (.072NS)	

N s: Not significant

Table (3) shows that at pre-test, the total mean score of the positive and negative syndrome of the studied patients was (77.2± 18.2) in comparison to the controlled was (74.07± 20.9) with no statistical significance differences between the studied and controlled patients (p-value = 0.460).

Concerning the post-test, the same table clarifies that the total mean score of the positive and negative syndrome of the studied patients was (35.57± 4.33), in comparison to the controlled group was (55.97± 14.71), with high statistical significance differences between the studied and controlled patients (p-value ≤ 0.001).

At the follow-up, the same table illustrates that the total mean score of the positive and negative syndrome of the studied patients was (45.17± 1.5), in comparison to the controlled patients was (50.07± 1.9), with no statistical significance differences between the studied and controlled patients (p-value≥ 0.072).

Table 4: Mean score of Barratte impulsivity scale among schizophrenic patients (no.40)

Items	Different times of testing	Pre-test		Post-test		Follow up	
		Control (No.=40)	Study (No.=40)	Control (No.=40)	Study (No.=40)	Control (No.=40)	Study (No.=40)
		Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD
	Attention	19.47±5.91	20.17±4.86	13.8±3.1	8.85±2.24	12.02±2.54	10.9±2.2
	T-test (p-value)	.68 (.49NS)		9.8(0.001**)		2.13 (.039*)	
	Motor facet	24.95±5.49	24.87±5.44	21.2±4.3	18.37±1.23	20.2±4.04	19.3±2.8
	T-test (p-value)	.065(.94NS)		.43(0.001**)		1.046 (.30NS)	
	Plan	31.12±4.56	31.2±4.11	25.7±4.1	17.32±2.39	24.3±4.24	22.1±3.0
	T-test (p-value)	.087(.93NS)		11.49(0.001**)		2.77(.008*)	
	Total Impulsivity	75.5±13.19	76.25±10.77	60.8±8.63	44.55±3.98	56.5±8.03	52.4±5.79
	T-test (p-value)	.30(.76NS)		12.52(0.001**)		2.76(.009*)	

N s: Not significant

Table (4) illustrates that, at pre-test, the mean score of total impulsivity of the studied patients was (76.25±10.77) in comparison to the controlled patients (75.5±13.19), with no statistical significance difference between the studied and controlled patients (p-value≥ 0.76).

Regarding the post-test, the same table shows that the total impulsivity of the studied patients was (44.55±3.98) in comparison to the controlled patients (60.8±8.63), with highly statistical significance difference between the studied and controlled patients (p-value ≤ 0.001).

At the follow-up test, the same table shows that the total impulsivity of the studied patients was (52.4±5.79) in comparison to the controlled patients (56.5±8.03), with statistical significance differences between the studied and controlled patients (p-value ≤ 0.009).

Table 5: Relation between socio-demographic and clinical data regarding positive and negative syndrome for control patients (no.40)

Items	Control group					
	Pre-test Mean +SD	Anova or (t-test) (p-value)	Post-test Mean +SD	Anova or (t-test (p-value)	Follow up Mean +SD	Anova or (t-test) (p-value)
Age						
<20:29	79.1+21.1		59.4+16.4		52.6+14.3	
30:40	72.1+20.3	.911 (.4NS)	54.1+13.4	.756 (.477 NS)	48.1+9.94	.595 (.55NS)
>40	67.1+22.4		52.5+13.7		49.0+11.8	
Gender						
Male	73.8+21.4		56.4+15.2		50.3+12.5	
Female	75.5+20.2	.178 (.8 NS)	53.5+12.7	.442 (.661 NS)	48.6+6.60	.306 (.76 NS)
Marital statues						
Single	72.8+21.1		55.7+15.5		49.9+13.5	
Married	74.6+21.4	.442 (.6 NS)	55.5+13.8	.454 (.639 NS)	49.6+10.1	.338 (.71 NS)
Divorce	93.0+0		70.0+0		60.0+0	
Educational level						
Illiterate	84.4+15.3		59.8+10.2		52.1+7.75	
Primary	82.8+19.9		63.5+20.4		56.3+17.3	
Preparatory	78.3+4.50	2.41 (.06 NS)	60.6+13.5	1.59 (.196 NS)	54.3+15.1	1.29 (.29 NS)
Secondary	66.8+21.8		51.5+13.3		46.8+10.7	
University	50.5+27.5		43.0+16.9		40.5+13.4	

Items	Pre-test	Anova/(t-test)	Post-test	Anova/(t-test)	Follow up	Anova/(t-test)
Post university	-		-		-	
Occupation						
Don't work	70.2±23.5	1.19 (.3 NS)	54.1±15.5	1.15 (.350 NS)	48.8±12.5	1.22 (.31 NS)
Work	75.6±18.3		57.4±14.1		51.4±11.3	
Residence						
Rural	74.3±21.6	.233 (.8 NS 7)	56.5±15.2	809 (.423 NS)	50.6±12.3	.1.10 (27 NS)
Urban	71.3±10.6		49.3±9.60		42.6±4.72	
Duration of diseases						
<1	76.9±20.1	3.11 (.05 NS)	57.3±14.5	1.76 (.186 NS)	50.7±12.0	1.31 (.28 NS)
1-3	31.0±0		31.0±0		31.0±0	
>3	67.0±18.9		53.3±13.7		49.8±11.8	
Previous hospitalization						
Yes	73.2±22.6	.068 (.79 NS)	55.6±16.5	.025 (.874 NS)	49.6±13.9	.048 (.82 NS)
No	74.9±19.7		56.4±13.4		50.5±10.2	
Frequency of admission						
Once	71.9±25.5	.243 (.866 NS)	54.5±18.8	.095 (.963 NS)	48.5±15.8	.221 (.88 NS)
Twice	85.0±9.89		55.0±4.24		47.5±.707	
> 2 times	71.8±19.4		58.6±14.7		53.4±11.9	

No significant difference (p value >0.05) *: Significant difference (p value ≤ 0.05) **: highly significant difference (p value ≤ 0.001

Table (5) shows no significant relation between socio-demographic data and positive and negative syndrome for control patients.

There was no statistical significance relation between controlled patients' clinical data and positive and negative syndrome at pre-, post, and follow-up (p-value >0.05).

Table 6: Relation between socio-demographic and clinical data regarding positive and negative syndrome for studied patients (no.40)

Items	Study group					
	Pre-test Mean ±SD	Anova or (t-test) (p-value)	Post-test Mean ±SD	Anova or (t-test) (p-value)	Follow up Mean ±SD	Anova or (t-test) (p-value)
Age						
<20:29	78.5±16.7	.100 (.905 NS)	36.0±3.51	.681 (.512 NS)	45.3±8.08	.006 (.994 NS)
30:40	75.8±12.0		36.2±6.28		45.0±12.2	
>40	76.1±25.5		34.2±3.58		45.0±11.6	
Gender						
Male	77.6±18.1	.348 (.730 NS)	36.2±4.44	1.99 (.05 NS)	46.3±10.1	1.58 (.12 NS)
Female	76.0±19.7		32.7±2.21		39.8±7.71	
Marital statues						
Single	77.5±19.3	.498 (.686 NS)	36.2±5.12	.445 (.72 NS)	45.5±10.7	.559 (.64 NS)
Married	72.6±18.7		34.5±2.87		42.5±8.73	
Divorce	80.2±12,6		35.0±1.58		49.2±9.01	
Widow	94.0±0		33.0±0		40.0±0	
Educational level						
Illiterate	77.5±16.3	.568 (.72 NS)	36.6±5.95	.611 (.69 NS)	45.4±12.2	.885 (.50 NS)
Primary	75.7±26.9		35.5±3.69		45.7±10.3	
Preparatory	79.5±15.7		34.8±1.57		41.5±4.31	
Secondary	80.4±20.1		36.3±4.65		48.8±10.5	
University	73.7±10.9		33.7±2,21		44.0±8.75	
Post university	57.5±27.5		32.0±2.82		35.5±6.36	
Occupation						
Don't work	77.7±18.2	1.23 (.31 NS)	36.2±5.87	.494 (.74 NS)	46.4±11.8	.884 (.48 NS)
Work	83.7±.707		35.5±2.12		45.5±2.82	
Residence						
Rural	77.1±18.9	.143 (.88 NS)	35.7±4.43	.930 (.35 NS)	45.4±10.1	.569 (.57 NS)
Urban	78.6±3.78		33.3±2.08		42.0±7.21	
Duration of diseases						
<1	79.5±19.6	.646 (.53 NS)	35.7±3.64	.078 (.92 NS)	45.3±9.42	.324 (.72 NS)
1-3	74.5±14.8		35.0±0.816		48.2±8.84	
>3	72.1±15.5		35.3±6.61		43.5±12.2	
Previous hospitalization						
Yes	78.6±17.7	.383 (.54 NS)	34.7±2.90	2.24 (.14 NS)	42.9±7.74	3.25 (.07 NS)
No	75.0±19.2		36.8±5.75		48.5±12.1	
Frequency of admission						
Once	74.6±13.1	.175 (.91 NS)	60.3±8.59	.175 (.91 NS)	56.4±8.66	.175 (.91 NS)
Twice	82.0±8.84		60.5±2.12		58.5±.707	
> 2 times	76.2±12.8		64.6±8.20		58.2±5.63	

No significant difference (p value >0.05) *: Significant difference (p value ≤ 0.05) **: highly significant difference (p value ≤ 0.001)

Table (6) shows no significant relation between socio-demographic data and positive and negative syndrome for studied patients. As regards age, it was observed that the highest mean score of positive and negative syndrome was among patients in the age group (<20:29) (78.5±16.7) at the pre-test compared to (36.0±3.51) at the post-test.

As regards educational level, it was observed that the lowest mean scores of the positive and negative syndrome among

post university educational group at the pre-post and follow-up of the program (57.5+27.5), (32.0+2.82), and (35.5 + 6.36) respectively. There was no statistically significant relation between positive and negative syndrome and their clinical data at pre-, post, and follow-up (p-value >0.05).

The same table shows that the highest mean scores of the positive and negative symptoms were among patients previously hospitalized (78.6+17.7) at pre-test compared to (34.7+2.9) at post-test and (42.9+7.7) at follow-up.

Table 7: Relation between socio-demographic and clinical data regarding impulsivity for the controlled patients (no.40)

	Control patients					
	Pre-test **Mean +SD**	**Anova or (t-test) (p-value)**	**Post-test** **Mean +SD**	**Anova or (t-test (p-value)**	**Follow up** **Mean +SD**	**Anova or (t-test) (p-value)**
Age						
<20:29	78.5+13.6	.920 (.407 NS)	63.1+10.1	1.14 (.331 NS)	57.6+9.68	.542 (.58 NS)
30:40	74.8+13.5		60.1+7.97		56.6+7.48	
>40	70.5+11.2		57.5+5.71		53.8+4.88	
Gender						
Male	76.3+11.9	.774 (.384 NS)	61.4+7.54	1.06 (.309 NS)	56.6+6.95	006 (.93 NS)
Female	71.2+19.9		57.5+13.7		56.3+13.5	
Marital statues						
Single	75.2+11.8	.204 (.817 NS)	61.1+8.13	.058 (.943 NS)	56.3+7.94	.036 (.96 NS)
Married	75.5+15.5		60.7+9.80		57.0+8.64	
Divorce	84.0+0		58.0+0		56.00+0	
Widow	-		-		----	
Educational level						
Illiterate	83.3+10.9	2.04 (.110 NS)	63.0+7.71	1.24 (.311 NS)	57.4+5.92	.831 (.515 NS)
Primary	75.7+13.1		62.4+10.6		58.1+5.85	
Preparatory	72.0+4.35		62.3+8.32		58.3+5.85	
Secondary	73.6+14.1		60.1+8.18		56.2+8.91	
University	58.5+2.12		49.0+7.07		47.0+5.65	
Post university	-		-		-	
Occupation						
Don't work	75.5+15.1	1.28 (.293 NS)	62.9+9.84	.806 (.553 NS)	57.8+10.1	.395 (.849 NS)
Work	76.4+1.41		59.8+2.12		54.6+1.41	
Residence						
Rural	75.7+13.1	.299 (.767 NS)	61.1+8.85	.729 (.470 NS)	56.7+8.29	.423 (.674) NS
Urban	73.3+17.1		57.3+4.72		54.6+3.78	
Duration of diseases						
<1	77.4+12.9	1.99 (.151 NS)	61.4+8.89	.483 (.621 NS)	56.8+8.62	.271 (.764 NS)
1-3	60.0+0		54.0+0		51.0+0	
>3	69.0+12.5		59.2+7.93		56.0+5.35	
Previous hospitalization						
Yes	75.7+12.3	.009 (.925 NS)	61.4+8.04	.159 (.692 NS)	57.1+7.41	.167 (.685 NS)
No	75.3+14.2		60.3+9.35		56.1+8.76	
Frequency of admission						
Once	74.6+13.1	.175 (.913 NS)	60.3+8.59	.175 (.913 NS)	56.4+8.66	.175 (.913 NS)
Twice	82.0+8.84		60.5+2.12		58.5+.707	
> 2 times	76.2+12.8		64.6+8.20		58.2+5.63	

Table (7) demonstrates no significant relation between socio-demographic and clinical data regarding impulsivity among the controlled patients.

Table 8: Relation between sociodemographic and clinical data regarding impulsivity for the studied patients (no.40)

	Studied patients					
	Pre-test **Mean +SD**	**Anova or (t-test) (p-value)**	**Post-test** **Mean +SD**	**Anova or (t-test (p-value)**	**Follow up** **Mean +SD**	**Anova or (t-test) (p-value)**
Age						
<20:29	76.4+9.94	.183 (.834 NS)	44.2+4.48	.222 (.802 NS)	51.4+5.84	.599 (.555 NS)
30:40	77.6+8.70		44.6+3.80		53.0+6.07	
>40	74.7+14.2		45.2+3.43		53.7+5.67	
Gender						
Male	77.6+10.3	3.14 (.084 NS)	44.4+3.90	.106 (.747 NS)	52.2+5.69	.237 (.629 NS)
Female	69.8+11.4		45.0+4.61		53.4+6.65	
Marital statues						
Single	75.5+11.6	.31 3 (.816 NS)	44.6+4.42	.617 (.609 NS)	52.5+6.17	.394 (.758 NS)
Married	78.5+10.2		43.8+1.61		51.1+3.72	
Divorce	77.0+9.08		46.2+4.91		54.6+7.79	

Widow	69.0±0		41.0±0		51.0±0	
Educational level						
Illiterate	76.1±11.9		44.3±4.02		52.8±6.50	.313 (.902 NS)
Primary	74.5±14.8		43.7±2.06		51.5±7.14	
Preparatory	73.4±5.71		43.8±4.74		52.1±2.41	
Secondary	79.1±11.2	.465 (.800 NS)	45.9±4.48	.461 (.803 NS)	53.7±7.59	
University	78.5±8.50		43.0±3.16		50.0±1.41	
Post-university	69.0±19.7		45.0±4.24		50.5±.707	
Occupation						
Don't work	75.0±10.5	.926 (.460 NS)	44.7±4.97	.198 (.938 NS)	55.9±6.24	1.97 (.121 NS)
Work	80.0±1.41		45.1±2.82		50.2±.000	
Residence						
Rural	75.7±11.1	.960 (.343 NS)	44.4±4.07	.803 (.427 NS)	52.5±6.01	.549 (.192 NS)
Urban	82.0±1.00		46.3±2.08		50.6±1.15	
Duration of diseases						
<1	79.1±10.9		44.8±4.23		53.8±6.25	2.40 (.104 NS)
1-3	70.5±8.10	2.79 (.074 NS)	42.0±1.82	.916 (.409 NS)	51.5±3.41	
>3	71.2±9.18		44.7±3.80		48.3±4.02	
Previous hospitalization						
Yes	76.3±11.2	.030 (.977 NS)	44.4±3.97	.256 (.799 NS)	52.2±5.95	.264 (.793 NS)
No	76.2±10.3		44.7±4.10		52.7±5.72	
Frequency of admission						
Once	75.5±10.8		44.3±3.47		51,8±4.29	1.05 (.380 NS)
Twice	78.0±9.51	.249 (.861 NS)	45.7±5.60	.756 (.526 NS)	55.1±7.99	
> 2 times	73.7±15.1		42.8±2.11		50.1±4.41	

No significant difference (p value >0.05) *: Significant difference (p value ≤ 0.05) **: Highly significant difference (p value ≤ 0.001)

Table (8) shows no significant relation between socio-demographic data and impulsivity for studied patients. It was observed that the highest mean impulsivity score was among patients in the age group 30:40 years, 77.6±8.70 at pre-test compared to 44.6±3.80 and 53.0±6.07 at post-test and follow up, respectively. Regarding gender, it was observed that the highest mean score of impulsivity was among male patients, 77.6±10.3 at pre-test compared to 44.4±3.90 and 52.2±5.69 at post-test and follow-up respectively. There was no significant relation between socio-demographic and clinical data regarding impulsivity among the studied patients. The same table shows that the lowest mean scores of impulsivity were among patients admitted to the hospital more than two times, 73.7±15.1 at pre-test compared to 42.8±2.11 and 50.1+4.41 at post-test and follow up, respectively.

Table 9: Correlations between studied variables among studied and controlled patients (no=40)

Variables	Positive and negative syndrome		Impulsivity level	
	r	P	r	P
Positive and negative syndrome	1	1	.529	.001**
Impulsivity level	.529	.001**	1	1

N.B *Significant is considered highly significant at (p-value <0.01)

Table (9) displays that there is a positive correlation between the positive and negative syndrome and impulsivity (p-value ≤ 0.001.

Discussion
Schizophrenia is a severe mental illness that affects a person's motivation, behavior, perception, attention, affect, and reality testing, among other areas of functioning. A key symptom of schizophrenia is impulsivity, which has been highlighted time and time again. These occurrences pose a significant threat to public health because they can cause dangerous behaviors, such as violence, which is a common reason for people to end up in mental hospitals. Victims and patients alike endure long hospital stays, endure pain, and face greater stigma as a result [18].
Patients can benefit from a deeper understanding of their condition and its treatment through psycho-educational techniques. According to Herrera *et al*. [19], a better prognosis for people with schizophrenia is likely to result from more education and understanding about the disorder. The present study aimed to assess the effect of nursing educational program on positive and negative symptoms and impulsivity among Schizophrenic patients.

Regarding the total positive and negative syndrome among schizophrenic patients for controlled patients, the current study showed that nearly one third of the controlled patients had low positive and negative syndrome. This results come inconsistent with Miodownik *et al*., [20] who studied "Curcumin as add-on to antipsychotic treatment in patients with chronic schizophrenia: a randomized, double-blind, placebo-controlled study" and reported that the most of schizophrenic patients have moderate mental disturbances. But this result come inconsistent with Baryshnikov *et al*., [21] who studied " Diagnostic conversion from unipolar depression to bipolar disorder, schizophrenia, or schizoaffective disorder: A nationwide prospective 15 year register study on 43 495 inpatients" and reported that more than one third of the studied sample have severe positive and negative symptoms

Concerning the total positive and negative syndrome among schizophrenic patients for studied patients, the present study illustrated that at pre-test, less than fifth of studied patients

have low positive and negative syndrome comparing to all of them at post-test and most of them at follow up. According to the researchers, these results could be attributed to the psycho-educational program's positive impact on patients' understanding of schizophrenia. This, in turn, encourages them to actively participate in their treatment. The program's interventions also led to higher levels of compliance, lower rates of relapse, and improved psychopathological status.

This result comes in accordance with Apriance & Sujatmoko, [22] who studied "The Role of Psycho-education Interventions in Preventing Schizophrenia Recurrence" and reported that the most of the studied sample had moderate to severe psychiatric symptom in pre intervention, comparing to the majority of them had low psychiatric symptom after intervention. In addition this result come in accordance with Bighelli *et al*., [23] who studied "Psycho-education for patients with schizophrenia and their families" and reported that psycho-education for patients with schizophrenia and their families can reduce the relapse rates of these patients.

Regarding the total positive and negative syndrome as well as their dimensions among schizophrenic patients, the present study showed that, the total means score of positive and negative syndrome of the studied patients were 77.2 ± 18.2 in contrast to the controlled were 74.07 ± 20.9 at pre-test with no statistical significance differences between the studied and controlled patients (p- value ≥ 0.460). From the researcher point of view this result may be due to both groups (studied and controlled) were under the same type of treatment before intervention.

Concerning post-test, the present study clarified that, the total means score of positive and negative syndrome of the studied patients were 35.57 ± 4.33, in contrast to the controlled patients were 55.97 ± 14.71, with highly statistical significance differences between the studied and controlled patient. At the follow up, the total means score of positive and negative syndrome of the studied patients were 45.17 ± 1.5, in contrast to the controlled patients were 50.07 ± 1.9, with no statistical significance differences between the studied and controlled patients (p- value ≥ 0.072) which could be associated with effect of psycho education program applied to study not controlled patients. This result come in the line with Shehu *et al*., [24] who studied "Effect of psycho-educational intervention on drug adherence and quality of life among patients with Schizophrenia in Jigawa State" and reported that psycho-educational interventions belong to a standard therapy program in acute and post-acute phases of patients with schizophrenia.

This results come in accordance with Alhadidi *et al*., [25] who studied "A systematic review of randomized controlled trials of psycho-education interventions for patients diagnosed with schizophrenia" and mentioned that the program had an effective effect on positive and negative symptoms. Also the same result was confirmed with Shinozaki *et al*. [26] who studied " Effects of a psycho-education program for people with schizophrenia aimed at increasing subjective well-being and the factors influencing those effects: a preliminary study" and reported that psycho-education can help improve negative and positive symptoms.

This result aligns with Ali *et al*., [27] who reported no statistical significance differences between the studied sample socio-demographic data and their positive and negative syndrome. While this results differ with Desalegn *et al*., [28] who studied "Quality of life and its association

with psychiatric symptoms and socio-demographic characteristics among people with schizophrenia: A hospital-based cross-sectional study" and reported that there was highly statistical significance differences between the studied sample demographic characteristics and their positive and negative symptoms.

Concerning the relation between the studied patients' positive and negative syndrome and their clinical data, the present study illustrated that, there weren't statistical significance differences between studied patients' positive and negative syndrome and their duration of diseases, admission to hospital and the mode of admission at pre, post and the follow up (p-value >0.05). This result differ with Ahmed [29] who stated that there were statistical significance differences between studied patients' positive and negative symptoms and the studied patient clinical history.

Concerning the relation between controlled patients' positive and negative syndrome and their clinical data, the current study illustrated that, there weren't statistical significance differences between controlled patients' positive and negative syndrome and their duration of diseases, admission to hospital and the mode of admission at pre, post and the follow up (p-value >0.05) this result may be attributed to most of upper Egypt population seek clinical care in specific circumstances which was the same for study and control group as duration of disease as a chronic illness, hospital admission which was controlled by health and hospital authorities applied for all patients without discrimination and involuntary mode of admission due to lack of insight.

This result comes in accordance with Desalegn *et al*., [28] who studied " quality of life and its association with psychiatric symptoms and socio-demographic characteristics among people with schizophrenia: A hospital-based cross-sectional study" and mentioned that there weren't statistical significance differences between the schizophrenic symptoms and the patients' clinical data. But this result come inconsistent with Abdel-Fadeel *et al*., [30] who studied "Clinical variables and factors affecting duration of hospitalization in a sample of patients with affective and non-affective psychoses" and reported that there were a statistical significance differences between the schizophrenic positive and negative symptoms and the patients' socio-demographic data.

Regarding the relation between the studied patient's impulsivity and their clinical data, the present study illustrated that, there weren't statistical significance differences between studied patient's impulsivity and their duration of diseases, admission to hospital, number of admission, and the mode of admission at pre, post and the follow up. These results were attributed to restricted range of inclusion and exclusion criteria as discussed before for studied and controlled patients.

This results come in the lines with Lau *et al*., [31] who studied " Increased mortality from somatic multi-morbidity in patients with schizophrenia: a Danish nationwide cohort study" and reported that there weren't statistical significant differences between the impulsivity and the patients' clinical data. Also this results come contraindicated with Amr *et al*., [32] who studied "Impulsive behavior and its correlates among patients with schizophrenia in a tertiary care psychiatry setting in Mansoura" and found a significant association between level of impulsive behavior and severity of psychopathological symptoms was observed

Regarding the correlations between study variables during different times of testing for two groups, the current study

displayed that; there was a positive correlation between the positive and negative syndrome and impulsivity. This result could be explained by the fact that increasing severity of positive and negative symptoms such as hallucination, delusion and social withdrawal increase patient affinity to impulse control disorder and impulsivity. This result come in accordance with Iancu *et al.*, [34] who studied " impulsivity, aggression and suicide risk among male schizophrenia patients " and reported that there were a positive correlation between the patient's positive and negative syndrome and impulsivity level. Also the same result was reported by Najafzadeh *et al.*, [35] who studied "Aggression in schizophrenia, bipolar and major depression disorder" and reported a positive correlation between positive and negative symptoms and total level of impulsivity.

Conclusion
Based on the findings of the present study, it can be concluded that, less than fifth of studied patients have low positive and negative syndrome comparing to all of them at post-test and the majority at follow up. Also, the minority of the studied patients had low impulsivity compared to all at post-test and the majority at follow up. In addition, there was no significant relation between socio-demographic data, positive and negative syndrome for both groups, no statistical significance relation between both groups' clinical data, positive and negative syndrome at pre, post and the follow up. Moreover, there was a positive correlation between the positive, negative syndrome and impulsivity.

Recommendations
Based on results of the present study it can be recommended that
a) Continuous provision of psycho-educational program should be developed in all psychiatric departments and social contexts to improve learning skills, maintaining the improvement in their social functioning among persons with schizophrenia and decrease positive and negative symptoms.
b) Encourage applying psych-educational program on positive, negative symptoms and impulsivity among schizophrenic patients to increase patient's awareness of their disease and to reduce the level of positive, negative symptoms and impulsivity and reducing the impact of the disease symptoms on their life.
c) Continuous implementing support programs, rehabilitation programs, workshop for the patients that focused on behavior management and stress management,
d) Encourage applying psycho educational program for family that facilitate an increased understanding of the illness, family therapy to involve families and relatives in the treatment planning and enlisted as a source of encouragement and support, support group that help in the stress relieve as well as suggesting strategies that may be useful in dealing with difficult behaviors.
e) Encourage Involving patients as much as possible and their relatives in the treatment plan to become active partner, gain their trust and cooperation.
f) Training programs and workshops need to be implemented for hospital staff to provide them with enough information, training, and skills about the importance of psych education.

For further research
- Replication of the study on a larger probability sample acquired from different geographical areas in Egypt to assess effect of psycho educational program on positive, negative symptoms and impulsivity among schizophrenic patients

Conflict of Interest
Not available

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Not available

References
1. Abou-Elmaaty GM, Shaheen SH, Eweida RS. Relationship between self-concept clarity, and Positive and negative symptoms among patients with Schizophrenia. Alexandria Scientific Nursing Journal. 2021;23(2):105-1114.
2. Ebrahim AS, El-Bilsha M, Elhadidy M. Social Support among Patients with Schizophrenia. Mansoura Nursing Journal. 2021;8(2):13-25.
3. Essam Ahmed H, Hassan Abdel Aal M, Hossny Shalaby M, Mohamed Ahmed F. Effect of Family Caregiver Expressed Emotion Control Program on Relapse among Patients with Schizophrenia. Journal of Nursing Science Benha University. 2022;3(1):855-872.
4. Durna G, Yorulmaz O, Aktaç A. Public stigma of obsessive-compulsive disorder and schizophrenic disorder: Is there really any difference? Psychiatry Research. 2019;271:559-564.
5. Kahn JM, Schooler NR, Marcy P, Correll CU, Achtyes ED, Gibbons RD, *et al*. Effect of Long-Acting Injectable Antipsychotics vs Usual Care on Time to First Hospitalization in Early-Phase Schizophrenia: A Randomized Clinical Trial. JAMA Psychiatry. 2020.
6. van Erp TG, Baker RA, Cox K, Okame T, Kojima Y, Eramo A, Potkin SG. Effect of brexpiprazole on control of impulsivity in schizophrenia: a randomized functional magnetic resonance imaging study. Psychiatry Research: Neuroimaging. 2020;301:111085.
7. Moulin V, Golay P, Palix J, Baumann P, Gholamrezaeec M, Azzola A, *et al*. Impulsivity in early psychosis: A complex link with violent behaviour and a target for intervention. European psychiatry. 2018;49:30-36.
8. Gotra MY, Hill SK, Gershon ES, Tamminga CA, Ivleva EI, Pearlson GD, *et al*. Distinguishing patterns of impairment on inhibitory control and general cognitive ability among bipolar with and without psychosis, schizophrenia, and schizoaffective disorder. Schizophrenia research. 2020;223:148-157.
9. Janah M, Hargiana G. Levels of stress and coping strategies in family caregivers who treat schizophrenic patients with risk of violent behavior. Journal of public health research. 2021;10(s1).
10. Ameel M, Kontio R, Välimäki M. Interventions delivered by nurses in adult outpatient psychiatric care: An integrative review. Journal of Psychiatric and Mental Health Nursing. 2019;26(9-10):301-322.
11. Saied M. Thinking and acting beyond the positive: the role of positive and negative symptoms in schizophrenia. CNS Spectr. 2020;19 Suppl 1:38-52; quiz 35-37,53.

12. Harvey C. Family psychoeducation for people living with schizophrenia and their families. BJPsych Advances. 2018;24(1):9-19.

13. Yilmaz I, Mediani HS, Lindayani L, Sriati A. How patients with schizophrenia "as a Victim" cope with violence in Indonesia: a qualitative study. The Egyptian Journal of Neurology, Psychiatry and Neurosurgery. 2020;57(1):1-6.

14. Young DY, Lai CY, Chang YS, Wu CK, Chung FC. The symptoms, resourcefulness, and quality of life in community-based patients with schizophrenia. Journal of clinical nursing. 2018;28(19-20):3582-3589.

15. Machin D, Campbell MJ, Tan SB, Tan SH. Sample size tables for clinical studies. John Wiley & Sons; 2011.

16. Kay S, Fiszbein A, Opler L. The Positive and Negative Syndrome Scale (PANSS) for schizophrenia. Schizophr Bull. 1987;13(2):261–276.

17. Barratt E. Impulsiveness subtraits: arousal and information processing. In: Spence JT, Izard CE, editors. Motivation, emotion, and personality. North-Holland: Elsevier Science; 1985. p. 137–146.

18. Chatterjee I. Understanding Schizophrenia: Introductory Aspect of the Mental Disorder from Various Perspectives. Cognizance of Schizophrenia: A Profound Insight into the Psyche. Springer; 2023. p. 1-14.

19. Herrera SN, Sarac C, Phili A, Gorman J, Martin L, Lyallpuri R, et al. Psychoeducation for individuals at clinical high risk for psychosis: A scoping review. Schizophrenia research. 2023;252:148-158.

20. Miodownik C, Lerner V, Kudkaeva N, Lerner PP, Pashinian A, Bersudsky Y, et al. Curcumin as add-on to antipsychotic treatment in patients with chronic schizophrenia: a randomized, double-blind, placebo-controlled study. Clinical neuropharmacology. 2019;42(4):117-122.

21. Baryshnikov I, Sund R, Marttunen M, Svirskis T, Partonen T, Pirkola S, et al. Diagnostic conversion from unipolar depression to bipolar disorder, schizophrenia, or schizoaffective disorder: A nationwide prospective 15-year register study on 43 495 inpatients. Bipolar disorders. 2020;22(6):582-592.

22. Apriance Y, Sujatmoko A. The Role of Psychoeducation Interventions in Preventing Schizophrenia Recurrence. Scientia Psychiatrica. 2021;2(2):135-141.

23. Bighelli I, Rodolico A, García-Mieres H, Pitschel-Walz G, Hansen W-P, Schneider-Thoma J, et al. Psychosocial and psychological interventions for relapse prevention in schizophrenia: a systematic review and network meta-analysis. The Lancet Psychiatry. 2021;8(11):969-980.

24. Shehu A, Gommaa H, Usman US, Usman ST, AuwalLawan K. Effect of psycho-educational intervention on drug adherence and quality of life among patients with Schizophrenia in Jigawa State, Nigeria.

25. Alhadidi MM, Lim Abdullah K, Yoong TL, Al Hadid L, Danaee M. A systematic review of randomized controlled trials of psychoeducation interventions for patients diagnosed with schizophrenia. International Journal of Social Psychiatry. 2020;66(6):542-552.

26. Shinozaki A, Hayashi T, Okamura H. Effects of a Psychoeducation program for people with schizophrenia aimed at increasing subjective well-being and the factors influencing those effects: a preliminary study. Psychiatric Quarterly. 2020;91:45-52.

27. Ali Mohammed Z, Abo-Bakr Osman O, Mohamed Barakat M. Relationship between Positive, Negative Symptoms and Quality of Life among Schizophrenic Patients. Journal of Nursing Science Benha University. 2022;3(2):1083-1098.

28. Desalegn D, Girma S, Abdeta T. Quality of life and its association with psychiatric symptoms and socio-demographic characteristics among people with schizophrenia: A hospital-based cross-sectional study. PloS one. 2020;15(2):e0229514.

29. Ahmed SEE. Impact of Social and Cognitive Rehabilitation Program on Schizophrenic Patients: Pre & Post study. Saudi J Nurs Health Care. 2021;4(10):333-348.

30. Abdel-Fadeel NA, Abdelhameed MA, Taha M. Clinical variables and factors affecting duration of hospitalization in a sample of patients with affective and nonaffective psychoses. Egyptian journal of psychiatry. 2017;38(2):112.

31. Lau JH, Jeyagurunathan A, Shafie S, Chang S, Samari E, Cetty L, Subramaniam M. The factor structure of the Barratt Impulsiveness Scale (BIS-11) and correlates of impulsivity among outpatients with schizophrenia and other psychotic disorders in Singapore. BMC psychiatry. 2022;22(1):226.

32. Amr M, Elsayed H, Ibrahim IM. Impulsive behavior and its correlates among patients with schizophrenia in a tertiary care psychiatry setting in Mansoura. Asian journal of psychiatry. 2016;22:111-115.

33. Iancu I, Bodner E, Roitman S, Sapir AP, Poreh A, Kotler M. Impulsivity, aggression, and suicide risk among male schizophrenia patients. Psychopathology. 2021;43(4):223-229.

34. Najafzadeh MJ, Ghazanfari Pour S, Divsalar P. Aggression in schizophrenia, bipolar and major depression disorder. Journal of Aggression, Conflict and Peace Research. 2023.