Effect of Emotion Regulation Program on Negative Symptoms among Patients with Schizophrenia

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Abstract

Background: Negative symptoms are common in people with schizophrenia and may be caused by emotional deficiencies**.** Emotion regulation involves the application of adaptive strategies and skills include acceptance, reappraisal, and reflection, affect labeling, and social support to manage emotional experiences, which all allow individuals to achieve desired goals**. This study aimed** to evaluate the effect of emotion regulation program (EMP) on negative symptoms among patients with schizophrenia. **Subjects and methods:** The research was performed at the psychiatric inpatient unit of Minia Hospital for Mental Health and Addiction Treatment which located in New Minia City. Fifty patients with schizophrenic disorder were included (No=50). **Each patient was evaluated through** Personal as well as clinical data questionnaire, Negative Syndrome Scale, and Emotion Regulation Questionnaire (ERQ). **Results** showed that there was a statistically significant variance in total negative symptoms, and emotion regulation scores among the studied patients after program implementation. **The study concluded that** emotion regulation program had a positive influence on patients' negative symptoms and emotion regulation. **Recommendations:** Psychiatric hospitals may encourage the use of emotion management interventions as a crucial part of the routine care and rehabilitation program for individuals with schizophrenia.

Keywords: Emotion regulation, Negative symptoms, & Schizophrenia

Introduction

Schizophrenia symptoms are divided into positive and negative categories. Available antipsychotics can control the majority of patients' positive symptoms. In contrast, they are ineffective against negative symptoms, social cognition deficiencies, and concurrent neurocognitive dysfunction, all of which significantly worsen functional outcome **(Behrouian et. al., 2021).**

A fundamental feature of schizophrenia and the primary cause of disability have long been thought to be negative symptoms. They are crucial to the disorder's functional outcome, and managing them is a major unmet need. Recently, the following points have been agreed upon: Brightened affect, alogia, anhedonia, sociality, and avolition are examples of negative symptoms that should be regarded as negative conceptions. It is important to distinguish symptoms attributed to identifiable factors, such as medication side effects, psychotic symptoms, or depression, from those considered primary for each construct. The five constructs cluster into two factors: one that includes blunted affect and alogia, and the other that consists of anhedonia, avolition, and a sociality **(Shen et al., 2021).**

Identifying emotion in another person or stimuli is known as emotion recognition, and it is most frequently researched with images of faces displaying a range of emotion expressions. A sender's facial, vocal, postural, and gestural cues—that is, an individual exhibiting an emotional response—are examples of nonverbal cues **(Gado et al., 2022).** Recognizing emotions has significant effects on wellbeing and quality of life. Schizophrenia patients struggle to identify, describe, comprehend, and control their emotions, which is linked to their disordered symptoms and poor social functioning (**Souto et al., 2020**).

Techniques for influencing the length, frequency, or strength of either positive or negative emotions are used in emotion regulation **(Chapman et al., 2020).** Additionally, emotion regulation improves a person's capacity to notice, evaluate, manage, and alter emotional reactions in order to accomplish a goal. When an

uncomfortable emotion arises, the goal is to lower it down to a level that the person can tolerate. The person has the option to intensify the emotion, lessen its impact, or prolong it in order to achieve the desired level of sensation. As a result, one can manage their emotions and control them **(Aktepe &Tolan, 2020).** A human adaptation process, emotion regulation has significant effects on day-to-day living. Schizophrenia patients often have emotional deficiencies, such as decreased experiential pleasure and impaired emotion expressiveness, which may be the cause of negative symptoms. Furthermore, distinct elements of emotional deficiencies might also be responsible for various undesirable symptoms **(Kyung et al., 2021))**

The goal of emotions regulation programs for schizophrenia (ERPS) is to build positive performance beliefs and to enhance the frequency, intensity, and length of pleasant emotional experiences. According to **Kimhy et al. (2020),** these emotion management techniques include sharing happy experiences with others, anticipating or recalling delight, expressing feelings through nonverbal behaviors, and focusing controlled attention on positive experiences when they arise. The main focus of the study was on two distinct emotion regulation techniques: expressive suppression (response modulation, where people alter their emotional response after it has begun) and reappraisal (cognitive change, where people adjust their state of mind regarding a particular situation) (**Seixas, et al., 2021**).

The feelings that patients experience is a crucial process that psychiatric nurses should adhere to when providing treatment, both in-person and remotely. Because people's adaptive or maladaptive ways differ depending on their personal traits, the type of condition they have, and their society, it is crucial to demonstrate an individual-specific strategy throughout this process. Given the significance of emotions as behavioral triggers, psychiatric nurses help patients develop the ability to identify, comprehend, and control their emotions in order to take control over their treatment. Psychiatric nurses must first be able to identify, comprehend, and control their own emotions in order to do this. Additionally, a supporting approach involving frequent research and training on emotion control among nurses is required **(Tekin 2020).**

Significance

The prevalence and incidence of schizophrenia in Egypt are comparable to those in other regions of the world. According to estimates, there are between 0.5 and 1.5 million people with schizophrenia in Egypt, and between 10,000 and 25,000 new cases are reported each year **(Abd El-Wahab, et. al., 2020).** Approximately twenty-four million people worldwide suffer from schizophrenia **(Institute of health Metrics and Evaluation, 2021).** In addition, an evidence-based nursing intervention that focuses on the emotional issues among those patients with psychiatric disorders face is called emotion regulation training intervention (**Arafat et. al., 2024**). Through it, patients gain emotional regulation, become more aware of their feelings, identify them, and express them in socially acceptable ways. Patients who participate in some emotion training programs can enhance their social engagement in social settings, build healthy personal relationships, and recognize and express their emotions more effectively (**El-Azzab, et. al., 2022**). Therefore, in order to give patients with chronic schizophrenia emotional support and mental stability and aid in their recovery from social decline and isolation, a psychiatric nursing intervention is necessary for patients who return to society once their acute symptoms have been handled.

Aim of the study:

This study aimed to determine the effect of emotion regulation program on negative symptoms among patients with schizophrenia.

Hypotheses:

- Patients with schizophrenia who participated in the emotion regulation program would have reduced scores in the negative symptoms after the program implementation than before.

- Emotion recognition and emotion expression of patients with schizophrenia would be improved after program implementation.

Patients and Method:

Design: A quasi-experimental research design (single-group pre-test, post-test & follow up) was used.

Setting: The research was performed at inpatient units of Minia Hospital for Mental Health and Addiction Treatment which located in New Minia City, Upper Egypt and connected to ministry of health. This hospital contains two floors; the first one includes the inpatient unit for females, outpatient clinics and pharmacy. The next floor comprises administration, nursing office, department dedicated to addiction treatment and male inpatient ward. The hospital has 53 beds available for patients of both genders. The nine districts of Minia Governorate are served by this hospital.

The sample:

A purposive sample of established diagnosed fifty hospitalized patients with schizophrenia brought in the previously indicated setting participated in the current research. Total annual admissions for schizophrenia in 2023 in Minia Hospital for Mental Health and Addiction Treatment were 166 patients. Using the following statistical formula, sample size was determined**:**

$$n = \frac{N}{(N-1)B2+1}$$ **Description of formula:**

n= the size of sample, N= The overall population as of the prior year, B= A percentage of error (0.05) (Thompson, 2012).

Inclusion Criteria:

- Adult patients (18 years and more).
- Sufficient cognitive capacity for completing the program.

Exclusion Criteria

- Presence of mental retardation.
- Patients with organic brain disorders.
- Comorbid diagnosis of substance abuse disorders.

Tools of data collection:

Data gathered by using the following instruments:

1-Demographic as well as clinical data created by researchers, which involves data about the patients' age, gender, education level, working status, period of illness, suicidal idea/attempt and type of treatment.

2-Scale for the Assessment of Negative Symptoms (SANS) was designed by **Anderson, (1984).** It is a commonly used tool for quantifying negative symptoms of schizophrenia. It composed of twenty-five items. The scale was grouped into 5 domains as: 1st was withdrawal or emotional poverty; the 2nd dimensions was alogia (lack of speech); the 3rd dimension was avolition and apathy (lack of energy, lack of initiative); the 4th dimension was anhedonia and social withdrawal (loss of interests); finally, the 5th dimension was attention. A 6-point Likert scale, with zero denoting absence and five denoting severities, is used to rate the items. The scale's overall score fell between 0 and 120. The researchers, along with psychiatric nursing specialists, performed both translation and reverse translation.

3-Emotion Regulation Questionnaire (ERQ)

Emotion Regulation Questionnaire developed by **Gross & John, (2003).** A ten-item test intended to gauge respondents' propensity for two types of emotional regulation: (1) Cognitive Reappraisal and (2) Expressive Suppression. The ten items comprise four for expression suppression and six for cognitive reappraisal, each strategy's score is the sum of its related items. Participants were requested to select from one to seven (one for "strongly disagree" to seven for "strongly agree"). Scoring (no reversals) Reappraisal Items: 1, 3, 5, 7, 8, 10; Suppression Items: 2, 4, 6, 9. The total scores of the seven-point scale range from 10 to 70; higher score indicates a greater emotion regulation.

Validity and Reliability

A panel of five specialists from Psychiatric and Mental Health Nursing domain assessed the study tools' content validity. The statements were reviewed for comprehensiveness, item sequencing, clarity, relevance, format, and applicability. The content of tools was valid and pertinent to the research aim based on the opinion of all jury members. The researchers employed the test-retest

approach to measure internal consistency to ascertain the reliability of the tools. The Cronbach's alpha coefficient test had been used to contrast repeated test responses. Internal consistency of RAS and LHS was estimated through the application of Cronbach's alpha coefficients test and resulted in values of 0.79 and 0.86, respectively that means excellent reliability.

EMP

The eight sessions of the intervention were given twice a week for four weeks, with two sessions dedicated to each of the four components of emotions that were covered: emotional recognition, emotional expression, emotional utilization, and emotional regulation. Five experts—two clinical psychologists and three professors of psychiatric nursing—examined the EMP's validity.

The actual study: There were four stages to the actual investigation:

Phase I (pretest): Assessment phase:

Using all available research instruments, the data was gathered by conducting individual interviews and distributing questionnaires to each patient in a way that was easy for them to understand. The baseline data from this phase was used to assess the requirements of the study participants prior to intervention. It took twenty-five to thirty-five minutes to complete the questionnaire.

Phase II Planning phase:

ERP was designed by the researchers following relevant literature reviews from textbooks and scientific journals, the findings of the previous phase, priorities, goals, as well as expected outcome criteria. This phase comprised setting the general objectives of the program, forming the specific aims for each session, and developing an evaluative strategy. The contents were prepared by the researchers using images, colorful sheets, various hues, and some vignettes representing different emotions, movies, and animated films. Eight categories were created from the studied patients, with each subgroup containing six patients to encourage interaction and practice. The program was designed to be completed in eight sessions, each lasting between 45 and 90 minutes, twice a week (Saturday & Wednesdays) **began from February to end of September, 2024.**

Implementation phase:

During this phase, the patients who involved in the research were classified into five subgroups; each groups contained 10 participants. The empowerment program covered the theoretical part about schizophrenia. Also, the program included several practical sessions in which teaching different styles of communication with applying on situations. In addition, teaching patients how to manage self-care activities and practicing them on stress management strategies was covered in the program.

A- Sessions pertaining to perception and emotional awareness:

Session one: This meeting serves as an introduction to the group members and the researchers in order to build rapport. It also explains the purpose, timetable, and content of the program and gauges the participants' emotional responses.

Session two: Explaining emotional concepts and types was the main focus of this session. Educating patients on the relationship between emotional language and facial expressions, as well as how to read others' emotions from their nonverbal cues and facial expressions.

B- Sessions pertaining to the display of emotions

Session three: The definition and significance of emotional expression were the main topics of this session. Additionally, techniques for expressing emotions include role-playing to convey the participants' basic feelings of grief, fear, contempt, fury, delight, and surprise.

Session four: This class focused on using group role-playing and instructions to convey emotions in various life circumstances.

C- Sessions pertaining to the use of emotions

Session five: This session focused on techniques for comprehending the emotions of others, such as employing a mood mask to help patients comprehend and identify the feelings of others.

Session six: Understanding complex emotions, learning how to flip between emotions

and achieve happiness, honing emotional inference abilities, and giving others encouraging and upbeat feedback were the main goals of this workshop.

D- Emotional modulation sessions

Session seven: The main goals of this session were to help the patient identify their own feelings before reacting or expressing them, as well as to explain and develop the tools and techniques for emotion regulation that are necessary to control emotions and build a new future based on the past.

Session eight: This session covered identifying and communicating a low mood, identifying and managing anger, anxiety, and other negative emotions in general, as well as summarizing all sessions.

Evaluation phase (Post-test):

This phase's objective was to assess the impact of the current program on the ability of patients with schizophrenia to recognize and express their emotions. To do this, tools II and III were reapplied twice (post/test).

Limitations of the Study

- Small sample size was conducted in the present research because the mentioned setting was the sole mental health hospital with little capacity serving Minia governorate and its entire districts.
- Absence of specific or noiseless area for meeting patients and applied the program, so, the researchers faced many interruptions and obstacles, which lead to frequent repetition.
- Difficult transportation is considering a main obstacle.

Pilot Study

As a means of assessing study's tools regarding their clarity, applicability, and time needed to complete them, a pilot study was performed on exactly 10% (5 participants) of entire sample size. The sample chosen for the pilot study was involved in the main study since the assessment tools were left unchanged**.**

Ethical considerations

Following official permission by the ethical committee of Minia University's Faculty of Nursing **(Code No.; REC202416)** was obtained the director of Minia Hospital for Mental Health and Addiction Treatment in New Minia City provided official approval for data collecting. Participants who matched the inclusion criteria for this research were interviewed by the researchers. In this step, the objective and nature of the study were clarified, and official permission was obtained. Patients were being told that their involvement in the research was entirely optional; the researcher also notified the patients regarding their possibility to leave the study whenever they want. The coding of the data ensured confidentiality and anonymity.

Statistical Analysis:

The data was organized, categorized, and analyzed using the Statistical Software for Social Sciences (SPSS) version 22. The 2013 release of the SPSS (IBM SPSS Statistics for Windows, Version 22.0, IBM Corporation, Armonk, NY, USA) was used to analyze the data. Descriptive statistics were used to report the mean and standard deviation of the data for the qualitative and quantitative variables, respectively. The statistical tests that were used were the correlation r-test, ANOVA test, and paired t-test. High significance was presumed if the P value was less than 0.05, and no statistically significant difference was considered if the P value was more than 0.05.

Results

Table (1): Reveals that the mean age of the studied patients is 27.18± 2.4 and that (46%) of them belong to age group average of 18 to 29 years, (66%) of them are males and about two thirds of them from rural areas. In addition, (52%) of the patients are single. Related to educational level, above half of patients (56%) are illiterate or only can read and write, and (58%) of them are not working.

Table (2) shows that less than half of the participants have the illness for 5yrs and more (48.0%), and 66.0% were admitted for more than 3 times. Additionally, most of them (82%) treated with drugs combined with ECT, while less than half of studied patient didn't attempted suicide (48%).

Figure (1) represents that, at baseline assessment, about three quarters of the patients (72%) exhibited high level of negative symptoms. Following the intervention, most of them (92%) showed low level of negative symptoms. However, at the follow-up assessment, 84% of the patients displayed low level of negative symptoms.

Table (3) indicates that, all dimensions and total of negative symptoms showed a high statistically significant variance at baseline, after the program was implemented, and during follow-up (P=0.001). Moreover, the mean score of total negative symptoms and its dimensions were decreased after implementation of the program (44.50± 6.30, 40.84± 5.69, & 72.12±12.89 respectively).

Figure (2) indicates that, at baseline assessment, the majority of the patients (84%) exhibited a low level of total emotion regulation. In addition, following the program intervention, about three quarters of them (76%) showed a high level of the total emotion regulation. However, at the follow-up assessment, (72%) of the patients displayed high level of total emotion regulation.

Table (4): Summarizes the presence of high statistically significant differences between pre and post-tests as well as follow up tests with P- value (0.001**). Moreover, the mean score of total emotional regulation and its dimensions were increased after implementation of the program.

Table (5): Clarifies that, there is a high statistically significant relation between both (gender and level of education) and negative symptoms at pre and follow up the program. Also, there is a high statistically significant relation between marital status and negative symptoms with P= (0.001). It was observed that, at pretest, the highest mean score of negative symptoms was among patients aged 18-29, female patients. At posttest, highest mean score of negative symptoms was among Male, rural and married patients. At follow up, the highest mean score of negative symptoms was among patients of 18-29, female, single and not working patients

Furthermore, the same table illustrates that, patients' level of education and negative symptoms scores are statistically significant related with P- value = (0.001*) at the pretest and follow up. **Also,** the patient's marital status negative symptoms scores are statistically significant related with P- value = (0.001*) at the pretest and follow up.

Table (6) indicates that, duration of illness and negative symptoms scores are statistically significant related with P- value = (0.006 &001 *) at baseline assessment and follow up respectively. In addition, patients' number of admission and negative symptoms scores are statistically significant related with P- value = (0.017 & 003*) at the pretest and follow up respectively. Moreover, there were statistically significant relation between number of suicide and negative symptoms at all time of assessment.

Table (7) illustrates that, patients' age and emotion regulation scores are statistically significant related with P- value = (0.04*) at baseline assessment and the highest mean in age group 18-29 years old during pre and post program. Additionally, the same table shows that, patients' gender and emotion regulation scores are statistically significant related with P- value = (0.001&.004 & 001*) at the pretest posttest and at follow up respectively. **Moreover,** the same table illustrates that, patients' level of education and negative symptoms scores are statistically significant related with P- value = (0.001& .001& .004*) at the pretest, post and follow up. **Also,** the patient's marital status emotion regulation scores are statistically significant related with P- value = (0.001*) at all time of assessment

Table (8) shows that, duration of illness and emotion regulation scores are statistically significant related with P- value = (0.001 &0.012& 0.001*) at baseline assessment and follow up respectively. Also, patients' number of admission and emotion regulation scores are statistically significant related with P- value = (0.041 & 0.002*) at the posttest and follow up respectively. Moreover, there were statistically significant relation between number of suicide and emotion regulation scores at pretest, posttest, and follow up at p-value (0.00, 0.002 & 0.002 respectively).

Table (9) indicates that, there is a statistically significant negative correlation between negative symptoms and emotion regulation at pretest, posttest, and follow up at p= (0.041, 0.006 & 0.003 respectively).

Table (1): Frequency distribution of the studied patients relating to their personal data (n= 50).

Personal data	no.	%
Age		
▪ 18-< 30 yrs.	23	**46.0**
▪ 30-<44 yrs.	21	42.0
▪ 44 +yrs.	6	12.0
Mean ± SD	**27.18± 2.457**	
Gender		
▪ Male	33	**66.0**
▪ Female	17	34.0
Residence		
▪ Urban	14	28.0
▪ Rural	36	**72.0**
Level of education		
▪ Illiterate or Read and write	28	**56.0**
▪ Secondary School	16	32.0
▪ High education	6	12.0
Marital status		
▪ Single	26	**52.0**
▪ Married	9	18.0
▪ Divorce	15	30.0
Working Status		
▪ Working	21	42.0
▪ Not Working	29	**58**.0

Table (2): Frequency distribution of the studied patients relating to their clinical data (n= 50)

Clinical data	no.	%
Duration of illness		
Less than one year	10	20.0
From one to three years	16	32.0
More than 3 years	24	**48.0**
Number of Admission		
One time	9	18.0
Two times	4	8.0
Three times	4	8.0
More than three times	33	**66.0**
Treatment		
Only drugs	9	18.0
Drugs With ECT	41	**82.0**
Number of Suicide attempt		
None	24	**48.0**
One time	20	40.0
Twice	6	12.0

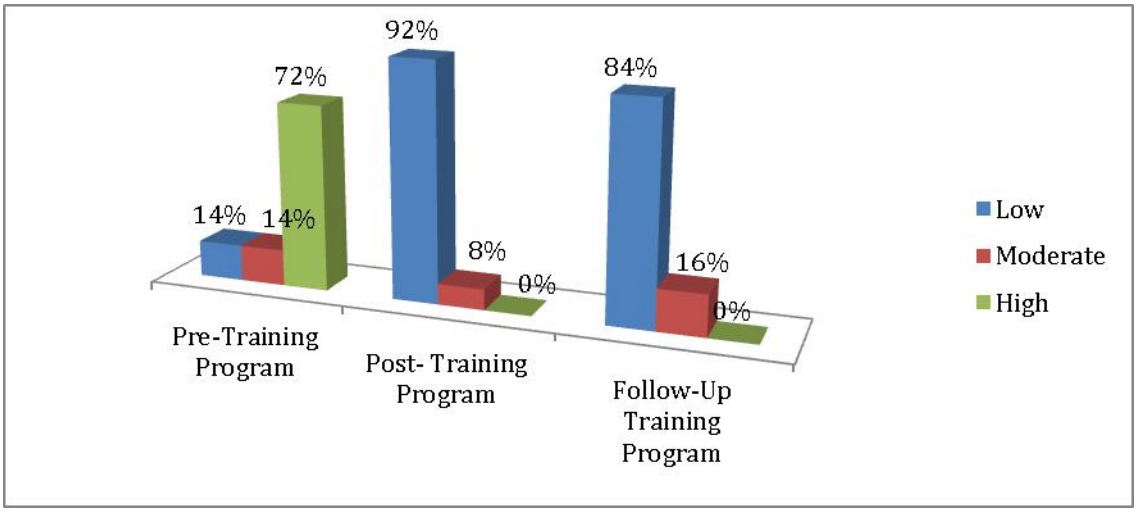

Figure (1): Frequency distribution of studied patients 'total negative symptoms levels at pre, post, and follow up (n = 50)

Table (3): Comparison of studied patients' total negative symptoms assessment scores and their dimensions between pre, post and follow- up (n = 50).

Different times of measurement					Total negative symptoms as well as their dimensions
ANOVA		Follow-Up Training Program	Post-Training Program	Pre-Training Program	
P	F	Mean ± SD	Mean ± SD	Mean ± SD	
0.001**	100.02	13.04±1.20	10.16± .81	16.96± 1.06	Affective Flattening / Blunting
0.001**	94.38	6.32±.92	6.28± 1.64	12.48± 4.06	Alogia
0.001**	99.65	9.00± .674	7.68± 2.65	13.80.± 3.05	Avolition/apathy
0.001**	92.65	10.50 ± 3.57	10.44± 3.28	18.28± 2.22	Anhedonia / A sociality
0.001**	92.04	5.84± 2.65	5.46 ± .50	10.60± 2.05	Attention
0.001**	185.41	44.50± 6.30	40.84± 5.69	72.12±12.89	Total negative symptoms

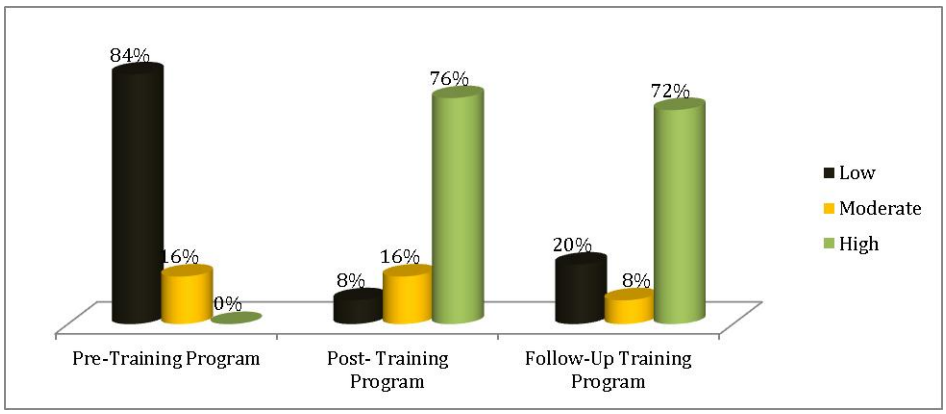

Figure (2): Frequency distribution of studied patients' total emotion regulation levels at pre, post, and follow up (n = 50).

Table (4): Table (4): Comparison of studied patients' total emotion regulation scores levels between pre, post and follow up (n = 50).

Different times of measurement					Total emotion regulation as well as its dimensions
ANOVA		Follow-Up Training Program	Post-Training Program	Pre-Training Program	
P	F	Mean ± SD	Mean ± SD	Mean ± SD	
0.001**	**103.26**	**19.06±4.79**	**19.84± 3.88**	**10.22± 1.86**	**Cognitive reappraisal**
0.001**	116.09	17.46± 4.20	17.76± 4.03	7.98± 2.45	**Expressive suppression**
0.001**	200.53	36.52 ± 8.97	37.60± 7.91	18.20± 4.15	**Total emotion regulation**

Table (5): Relation between total negative symptoms mean scores with personal data among studied patients at pre, post and follow up (n=50).

Personal data	Pre-Training Program	Post-Training Program	Follow-Up Training Program
	Mean ± SD	**Mean ± SD**	**Mean ± SD**
Age			
▪ 18-29	76.48±9.28	40.04±6.79	47.00±6.68
▪ 30-43	67.67±14.77	39.14±3.29	42.76±6.54
▪ 44-65	71.00±13.94	43.00±8.53	41.00±4.51
Anova-test (p-value)	2.797(0.071 NS)	1.022(0.368 NS)	3.400(0.042*)
Gender			
▪ Male	68.06±14.25	41.09±6.91	41.27±5.85
▪ Female	80.00±0.00	37.94±1.28	50.76±2.68
T-test (p-value)	3.438 (.001**)	1.853 (.070 NS)	6.334 (.001**)
Residence			
▪ Urban	74.21±11.49	37.93±2.34	45.50±4.88
▪ Rural	71.31±13.405	40.83±6.57	44.11±7.35
T-test (p-value)	.715 (.478 NS)	1.606 (.115 NS)	.651(.518 NS)
Level of education			
▪ Illiterate or Read and write	62.09±14.04	40.14±8.30	38.50±4.50
▪ Secondary School	80.00±0.00	40.36±3.02	49.41±4.17
▪ High education	80.00±0.00	38.33±1.21	48.50±1.55
Anova-test (p-value)	22.420(.001**)	.285(.753 NS)	41.539(.001**)
Marital status			
▪ Single	80.00±0.00	39.23±2.32	50.04±2.63
▪ Married	80.00±0.00	49.11+7.06	41.89±4.81
▪ Divorce	53.73±7.79	35.93±2.96	36.47±1.59
Anova-test (p-value)	200.537(.001**)	36.177(.001**)	109.081(.001**)
Working status			
▪ Worked	71.00±13.00	42.08±7.66	41.95±5.44
▪ Not Worked	73.15±12.88	38.12±2.21	46.88±7.0
T-test (p-value)	.588 (.559NS)	2.533 (.015)*	2.780 (.008*)

Table (6): Relation between total negative symptoms mean scores with clinical data among studied patients at pre, post and follow up (n=50).

Clinical data	Pre-Training Program	Post-Training Program	Follow-Up Training Program
	Mean ± SD	**Mean ± SD**	**Mean ± SD**
Duration of illness			
• Less than one year	80.00±0.00	37.00±0.00	52.50±1.95
• From one to three years	75.65±11.95	40.25±2.29	47.13±5.05
• More than 3 years	66.50±13.79	41.13±7.99	39.42±4.3
Anova-test (p-value)	5.681(.006)*	1.845(.169NS)	37.884(.001**)
Number of Admissions			
• One time	80.00±0.00	39.44±.88	48.44±1.01
• Two times	80.00±0.00	37.00±0.00	50.25±.50
• Three times	80.00±0.00	41.00±1.41	49.75±1.26
• More than three times	68.06±14.25	40.42±7.08	42.09±7.14
Anova-test (p-value)	3.777 (.017*)	.461(.711NS)	5.346(.003**)
Treatment			
• Typical	77.00±9.00	45.78±6.76	42.11±5.16
• With ECT	71.05±13.40	38.76±4.84	45.0244±6.98
T-test (p-value)	1.266 (.212NS)	3.661 (.001**)	1.180 (.244NS)
Number of Suicides			
• None	66.96±14.64	42.25±7.48	40.38±5.89
• One time	80.00±0.00	38.25±1.41	50.45±2.58
• Twice	69.20±14.88	37.60±4.83	42.0000±4.74
Anova-test (p-value)	6.049 (.001**)	2.674 (.058)*	18.159(.001**)

Table (7): Relation between emotional regulation mean scores with personal data among studied patients at pre, post and follow up (n=50).

Personal data	Pre-Training Program	Post-Training Program	Follow-Up Training Program
	Mean ± SD	**Mean ± SD**	**Mean ± SD**
Age			
• 18-29	19.69±5.29	40.35±5.78	34.74±10.27
• 30-43	17.29±0.76	35.14±8.29	36.90±8.54
• 44-65	15.67±0.94	35.67±9.53	42.00±0.00
Anova-test (p-value)	3.430(.041*)	2.764(.074NS)	1.633 (.206NS)
Gender			
• Male	16.36±1.25	35.33±8.91	40.45±4.85
• Female	21.76±5.14	42.00±0.00	28.88±10.68
T-test (p-value)	5.514 (.001**)	3.052(.004**)	5.435 (.001**)
Residence			
• Urban	16.71±1.49	37.93±2.34	45.50±4.88
• Rural	18.78±4.64	36.94±8.570	35.94±9.34
T-test (p-value)	1.604(.115NS)	.938 (.353NS)	.724 (.473NS)
Level of education			
• Illiterate -Read and write	16.15±2.04	32.00±9.31	39.59±6.50
• Secondary School	20.64±4.64	42.00±0.00	36.23±9.17
• High education	16.83±1.17	42.00±0.00	26.33±7.52
Anova-test (p-value)	9.094 (.001**)	15.769 (.001**)	6.281 (.004**)
Marital status			
• Single	20.62±4.44	42.00±0.00	32.77±10.63
• Married	14.67±0.71	42.00±0.00	42.00±0.00
• Divorce	16.13±1.79	27.33±7.60	39.73±5.59
Anova-test (p-value)	14.946(.001**)	65.583(.001**)	5.894 (.001**)
Occupation			
• Worked	16.00±1.00	37.33±8.66	40.58±4.45
• Not Worked	20.23±4.88	37.8±57.21	32.77±10.52
T-test (p-value)	4.157 (.001**)	.227 (.822NS)	3.390 (.001**)

Table (8): Relation between emotion regulation mean scores with clinical data among studied patients at pre, post and follow up (n=50).

Clinical data	Pre-Training Program	Post-Training Program	Follow-Up Training Program
	Mean ± SD	**Mean ± SD**	**Mean ± SD**
Duration of illness			
1y-less than 3y	24.70±4.87	42.00±0.00	25.30±9.95
3y-less than 5y	17.88±1.05	39.75±6.29	36.38±8.05
5yrs and more	15.71±1.79	34.33±0.99	41.29±3.43
Anova-test (p-value)	49.740(.001**)	4.837(.012*)	19.840 (.001**)
Number of Admission			
1 time	17.89±0.72	42.00±0.00	35.78±9.31
2 times	21.25±6.32	42.00±0.00	21.75±2.50
3 times	50.00±0.50	42.00±0.00	42.00±0.00
more than 3 times	17.85±4.25	35.33±8.08	37.85±8.14
Anova-test (p-value)	.831(.484NS)	2.976(.041*)	5.605(.002**)
Medication			
Typical	16.00±1.41	39.89±6.76	40.11±5.16
With ECT	18.69±4.40	37.09±8.84	35.73±9.97
T-test (p-value)	1.796 (.079NS)	.958(.343NS)	.025 (.188NS)
Number of Suicide			
None	16.50±1.64	34.42±9.48	39.88±5.89
1 time	21.35±4.83	42.00±0.00	30.85±10.58
Twice	14.20±1.09	38.20±8.83	42.00±0.00
Anova-test (p-value)	11.005 (.001**)	5.832 (.002**)	5.880(.002**)

Table (9): Correlation between negative symptoms scores and emotion regulation scores among studied patients at pre, post, and follow up (n=50).

Emotion regulation			Negative symptoms
Follow up	**Post-test**	**Pre-test**	
		-0.290* (0.041)	Pre-test Training Program
	-0.387** (0.006)		Post-test Training Program
-0.416** (0.003)			Follow-Up Training Program

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

Discussion:

Social functioning deteriorates in many people with schizophrenia due to a reduced capacity for empathy and the ability to recognize their own or others' feelings. However, patients' negative symptoms, emotional expression, and emotion awareness may all be improved by emotional management training (**Park et al., 2021).** So, the current study aimed to explore the effect of an emotion regulation program on negative symptoms among patients with schizophrenia.

The actual study results demonstrated that slightly lower half of patients were between 18-29 years. This might be attributed to that schizophrenia is a chronic condition that typically emerges in early adulthood and late adolescence. This outcome is not consistent with **Park et al., (2021)** who found that (58.5%) from examined schizophrenic patients were between 50 and 59 years.

As regard gender, it was found that the most of studied patients being males. This may be because schizophrenia affects males more frequently than it does women also; men experience schizophrenia at a younger age than women do. This result aligned with **El sayed et al (2024),** who reported that, (76.7%) of schizophrenic patients being males.

Concerning to educational levels, findings of this study indicated slightly more than half of participants were illiterate and had low levels of education (only read and write). This could be interpreted as schizophrenia negatively affects the cognitive abilities which consequently affect on their educational achievement. In addition, the earlier onset of the schizophrenia and severity of its symptoms are considered barriers for continuing education. The finding is similar to **El-Azzab et al (2022)** reported that (70%) of schizophrenics could read and write and low educated. And it is incompatible with **Twafik et al (2021).** Who reported that, only 6.7 of patients read and write.

Also, slightly above half of participants in the current study were single. This finding might be attributed to the stigmatizing characteristics of mental illness that limit most of patients with schizophrenia to be married as other individuals considered them less than others in responsibility another attribution to the stigma associated with mental illness, inability to work and low income. This outcome was in line with Egyptian studies as **Refai et al., (2024)** found that above three quarters of schizophrenic patients were single, **Ella et al., (2024)** observed that most of patients with schizophrenics were single and **(El-Azzab, et al., 2022)** stated that more than two-thirds of participants were single.

The findings of the actual research illustrated that, most of patients were not worked. The finding could be explained that patients' low level of education, their frequent hospitalization, stigma of schizophrenic disease, the negative effects of schizophrenia as positive\ negative symptoms, and the poor social skills hinder their ability to hold a job. The finding is dependable with that of **(Amin et al., 2023)** who revealed that (94%) of the schizophrenics were not working.

In terms of the patients' clinical data, the results proved that, the actual research illustrated that, slightly lower half of the patients had an illness for more than three years, and about two thirds of them admitted for more than three times. This might be connected to the factors that schizophrenia is the most prevalent long-term mental disorder and disabling condition non-adherence to medicine owing to forgetfulness or financial constraints, lack of family support, or having no family are the main reasons for readmission. This outcome aligns with the conclusions of **Galal et al., (2023)** who claimed that seventy five percent of the subjects suffered from the illness for two years and above. Similarly, **Ageeb et al., (2023)** corroborate this conclusion and clarified that most of the sample was having the disease for more than three years.

As regards received treatment, the current study illustrated that, most of them treated with drugs combined with ECT, this result may be related to the combination of ECT with drugs successfully controlling both positive and negative symptoms and greatly enhancing day-to-day functioning. This outcome is in line with **Washington, (2022)** findings that ECT treatment decreased the likelihood of readmission to the hospital within six months, according to a review of hospital records from 2,131 individuals with schizophrenia.

Regarding numbers of suicide, the actual study revealed that, lower half of patient didn't

attempted suicide. This result may be related to suicidal behavior in schizophrenia is driven by psychotic process and those study group patient their positive symptoms were subsided and they only have a negative symptoms. This result is incongruent with **Olfson, (2021)** who reported that the youngest group had the highest suicide risk and the older age had the lowest.

Regarding total negative symptoms levels, the presented study revealed that, at baseline assessment, slightly less than seventy-five of the patients exhibited high level of negative symptoms. Following the intervention and at follow up, most of them showed low level of negative symptoms. This result wasn't agreed with research conducted by **Amin et al., (2023)** who illustrated that the majority of the studied patients had negative symptoms with a moderate level and more than one third of them experienced severe negative symptoms

The actual research results also revealed that affective flattening ⁄ blunting alogia, anhedonia/a sociality, inattention and others negative symptoms improved in the evaluation test and follow up of the patients than in the assessment test after implementation of the program on negative symptoms. These results may be related to the positive impact of the program activities displayed improvement in all domains of negative symptoms through applying different styles of communication, teaching patients how to manage self-care activities and practicing them on stress management strategies.

In this respect, several researches reported that positive emotion training programs can be used as an adjunctive non-pharmacological treatment modality to tackle negative symptoms of schizophrenia through development of an alternative and more positive way of thinking. Modifying defeatist thinking appear to be an essential to treat negative symptoms that are usually due to repeated failures in thinking among patients with schizophrenia (**Ibrahim, et al., 2024**).

This is consistent with (**Favrod et., al, 2019)** who stated that patients who took part in an emotion control training program experienced an improvement in social functioning and a decrease in unpleasant symptoms. There was an improvement in both negative symptoms, namely the reduction of experience and expression. Also, it is congruent with **Strauss et al., (2018)** who stated that, emotion regulation interventions were beneficial in addressing positive, negative, and neurocognitive symptoms.

As regarding the total emotion regulation, the majority of the patients exhibited a low level of total emotion regulation but after the program intervention and at follow up, about three quarters of them showed a high level of the total emotion regulation. These findings demonstrated that the program and its sessions, which taught patients to communicate their feelings by utilizing emotional words, repeating different emotional facial expressions, and expressing emotions through different words, were successful. Additionally, the program's content was detailed and targeted, incorporating a range of training techniques such as role-playing and creating masks that conveyed various emotions, in addition to the use of eye-catching images and videos.

This result is in line with studies that used a role-playing-based emotion management training program (**Cho & Jang 2019),** which found that the experimental group's emotional expression improved significantly more than that of the control group. According to the same line, after receiving emotion management training, patients with schizophrenia had noticeably greater trouble recognizing and characterizing feelings than healthy people **(Kyung et al., 2021).** Moreover, this result is congruent with **Tawfik et al., (2021), Abram et al., (2022)** concluded that the emotion regulation program has a critical effect on decrease emotion regulation problems and enhancing social functioning in schizophrenic patients, including making new friends, practicing self-care, and spending quality time with their spouses.

Moreover, the present study illustrated that, there were statistically significant variations between pre and post-tests as well as follow up tests regarding emotional regulation. Additionally, the program's effects on small groups that promote group discussions, exchange experiences, and enrich sessions with a valuable and engaging atmosphere may be the reason why the mean score of total emotional regulation and its dimensions increased after it was implemented. Additionally, it gives research participants enough time to absorb the program's material, and those exercises improve patients' ability to control their emotions.

These results were in line with those of **Zou et al. (2018),** who discovered that patients with schizophrenia who took part in the emotion management program improved their emotion recognition score against baseline at two weeks (a mid-program test) and four weeks (a post-test). Additionally, the outcome is in line with a study **(Tsotsi, Kosmidis & Bozikas 2017)** that demonstrated the efficacy of eight weeks of once-weekly, 90-minute training sessions in teaching patients with schizophrenia how to identify and communicate their feelings. This suggests that the current program may be used as an intervention to teach schizophrenic patients in the recovery stage how to express and identify their feelings. Furthermore, it is noted that the patients found the current program's content to be visually appealing during the session. Also, **Tawfik et al., (2021); Abram et al., (2022)** concluded that the emotion regulation program has a critical effect on reducing emotion regulation problems and enhancing social functioning in schizophrenic patients, including making new friends, practicing self-care, and spending quality time with their spouses.

Conclusion

From the results of this investigation, it can be inferred that, at baseline assessment, about three quarters of the patients exhibited high level of negative symptoms. Following the intervention, most of them showed low level of negative symptoms. However, at the follow-up assessment, the majority of the patients displayed low level of negative symptoms. at baseline assessment, the majority of the patients exhibited a low level of total emotion regulation. following the program intervention, about three quarters of them showed a high level of the total emotion regulation. However, at the follow-up assessment, about three quarter of them displayed high level of total emotion regulation. There is a statistically significant negative correlation between negative symptoms and emotion regulation at pretest, posttest, and follow up.

Recommendation

The study recommended the following:

- Creating an emotion regulation program with skilled and trained nurses for each institutionalized schizophrenic patient
- An emotion control program is advised for the treatment of mental patients as a non-invasive, non-pharmacological, low-cost, and economical approach.
- The findings set the stage for further research that will concentrate on the large-scale, systematic examination of emotion regulation-based interventions, their efficacy, outcomes, and treatment procedures for schizophrenia illness inpatients.

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