

Effectiveness of Nursing Intervention Program Based on Emotional Awareness and Emotion Regulation on the Social Functioning of Patients with schizophrenia

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Abstract

Background: Patients with schizophrenia have poorer social and vocational functioning, emotional dysregulation, cognitive and executive function deficits, which place a heavy strain on the person and the community. **Aim:** explore the effectiveness of the nursing intervention program based on emotional awareness and emotion regulation on the social functioning of patients with schizophrenia. **Design:** A quasi-experimental design, one group (pre and post-test) was utilized. **Subjects:** A purposive sample of 60 patients with schizophrenia. **Study setting:** Inpatient psychiatric wards at El-Azazi Hospital for Mental Health and Addiction Management in Abo Hamad City, Sharqia Governorate, Egypt. **Tools:** Demographic and clinical data questionnaire of schizophrenic patients, Toronto Alexithymia scale, emotion regulation questionnaire, and social function questionnaire. **Results:** The nursing intervention program based on emotional awareness and regulation had a statistically significant effect ($P = 0.0001$) on social functioning among studied patients with schizophrenia. **Conclusion:** The nursing intervention program based on emotional awareness and regulation has a great effect in enhancing social functioning, raising emotional awareness and regulation as well as lowering alexithymia levels in studied schizophrenic patients. **Recommendation:** Emotional awareness and regulation intervention nursing program should be given to all schizophrenic patients to improve their social functioning, enhance emotional awareness, regulation and reduce their levels of alexithymia.

Keywords: Emotional awareness, Emotion regulation, Schizophrenia & Social functioning.

Introduction:

Schizophrenia is a serious psychological condition affecting 1% of individuals, posing a substantial burden on the individual, the family, and the community. Diagnosis of schizophrenia depends on several manifestations linked with poor social or professional performance. Schizophrenia compromises several of the psychopathology domains, including executive functions, abstraction, memory, and attention as manifested by disorganization (thought disorders), adverse symptoms (the absence of enthusiasm, social detachment, and diminished effect), emotional symptoms (mania or depression), psychotic symptoms (hallucinations and delusions), and cognitive dysfunction (Scemes et al., 2019).

A meta-analysis assessing empathy and interpersonal relationships in schizophrenia found that persons with the disorder have lower levels of empathy and perspective-taking, as well as higher levels of interpersonal suffering than healthy controls (Bonfils et al., 2017). Additionally, most schizophrenic patients struggle to distinguish subtle variations between neutral, positive, and negative stimuli as well as to identify their emotions and act following them (Painter et al., 2019). Further, they use incorrect emotional expression and communication techniques

and struggle to understand or sympathize with others' feelings (Hargreaves et al., 2016). The social functioning of these people is impacted partially by these symptoms (Abramowitz et al., 2014).

Emotions are essential for social interaction because they inform about the significance of the social settings that individuals live in and suggest what individuals should do about them. Everything required for appropriate living is part of social functioning, including independent living skills such as cooking, cleaning, hygiene, and so on, creating healthy connections with family, friends, and significant others, and educational and occupational achievements (Lin, et al., 2013).

The ability to communicate one's feelings through proper words or acts is called emotional expression (Kring & Elis, 2013). The ability to identify one's own or others' feelings, as well as recognize and assess complicated and nuanced emotions, is referred to as emotion recognition (Castro et al., 2016). A meta-analysis of emotions discovered that schizophrenia patients were more likely to experience negative emotions such as depression than pleasant ones when compared with healthy controls. Additionally, a study using emotion attribution exercises revealed that these individuals have a deficiency in their "theory of mind," reflecting a

limited capacity for empathy. Furthermore, people with schizophrenia have reduced emotional comprehension and awareness, limiting their ability to appreciate social situations and respond appropriately (Kolavarambath et al., 2020). Although acknowledging and expressing one's own and others' feelings is essential for schizophrenia patients' successful social adjustment (Park, 2018). Furthermore, emotional dysregulation has general deficits in four connected but separate areas; first, acknowledgment, comprehension, and acceptance of emotions; second, engagement in purposeful actions while reducing impulsivity when faced with negative emotions; third, participation in strategies appropriate for certain situations to adjust emotional responses; and fourth, enduring adverse feelings as a necessary part of significant life events. The employment of faulty cognitive feeling adaption mechanisms in schizophrenia spectrum disorder may therefore be influenced by interactions between these components rather than by a single factor of low emotional awareness (Liu et al., 2020).

In addition to assisting the patient and family, psychiatric nurses also have duties that include minimizing stigma, developing interpersonal relationships, promoting emotional awareness, emotion management, and initiative, fostering talents to solve problems, and imparting social skills. For this reason, psychiatric nurses may use one of the psychoeducational subjects of emotional awareness education in caring for patients with schizophrenia. Emotional regulation training has been seen to enhance patients' emotional awareness and regulation, as well as their quality of life, life skills, enjoyment of life, and social functionality (Başoğul, 2021).

Significance of the study

Over 19,776,900 people worldwide suffer from chronic and severe schizophrenia (James et al., 2018). Schizophrenic patients usually face hardships at work and/or in their family relationships, which lowers the quality of their lives. These problems arise from positive symptoms like delusions, hallucinations, disordered speech and manners, as well as negative symptoms such as affective flattening (Huang & Hsiao, 2017).

Schizophrenic patients lack the social and practical abilities needed for day-to-day tasks and to fulfill their social obligations. Therefore, programs based on emotional awareness and regulation strongly emphasize teaching participants new skills that will enhance their social relations, independence, and other consequences relevant to the functioning of communities.

An evidence-based nursing intervention that focuses on the emotional issues those patients with

psychiatric disorders face is called emotion regulation **training intervention. Through it, patients gain emotional regulation, become** more aware of their feelings, identify them, and express them in socially acceptable ways (Won et al., 2012).

Aim of the study:

The current study was conducted to explore the effectiveness of the nursing intervention program based on emotional awareness and emotion regulation on the social functioning of schizophrenic patients.

This was achieved through the following objectives:

- Assess alexithymia, emotion regulation and social functioning for studied patients with schizophrenia.
- Design a nursing intervention program based on emotional awareness and emotion regulation (EARNIP) for studied patients with schizophrenia.
- Implement a nursing intervention program based on emotional awareness and emotion regulation (EARNIP) for studied patients with schizophrenia.
- Evaluate the effectiveness of a nursing intervention program based on emotional awareness and emotion regulation (EARNIP) on emotion regulation and social functioning of studied patients with schizophrenia.

Study hypotheses:

Patients with schizophrenia who participated in the emotional awareness and emotion regulation nursing intervention program will exhibit improvement in their social functioning after the application of the program than before.

Subjects and Method:

Study Design:

A quasi-experimental one group with pre- and post-test.

Study Setting:

The present study was performed at the inpatient psychiatric wards of Elazazi Hospital for Mental Health and Addiction Management, Abo Hamad City, Sharqia Governorate, Egypt. This hospital is associated with the Ministry of Health and under the supervision of the General Secretariat of Mental Health in El Abbasia Mental Health Hospital in Cairo, Egypt. It works around the clock, seven days a week, and provides care for patients with acute and chronic psychiatric disorders mostly for individuals from the lower and middle socioeconomic strata, with a capacity of 250 beds. It includes three outpatient clinics for follow-up care, including a clinic for psychiatric disorders, a second one for drug use, and a third one for child psychiatry. Besides inpatient psychiatric departments, the hospital has three units for males and one for females along with a room for electroconvulsive therapy (ECT), and three units for drug addict inpatients (one for detox and two for rehabilitation and psychotherapy services).

Subjects, Sample Size Estimation, and Sampling Procedures**Subjects:**

A purposive sample of sixty male and female inpatients with schizophrenia was randomly assigned to the experimental group from the above-mentioned setting. The inclusion criteria for recruiting the study participants included being 18-50 years old, being diagnosed as a schizophrenic patient for at least one year, taking antipsychotics, having the ability for relevant communication, and readiness to partake in the study. Participants were excluded in case of acute symptoms or signs of organic brain disorders, possible neurological disorders, mental retardation, and current alcohol or drug dependence (must have more than 90 days of sobriety).

Sample Size:

Assuming low emotion regulation difficulties in the pre-intervention program is 23.3%, which is expected to increase to 50% in the post-intervention program (Tawfik, et al 2021); the confidence level is 95%, and two sides with the power of study 80%. The sample size calculated using Open Epi was 60 patients after adding the 10% non-responses. While, Open Epi, Version 3, and open source calculator-SSPropor

Tools for Data Collection:

The essential data were collected using four tools described below.

Tool I: A Self-Administered Questionnaire about Demographic and Clinical Characteristics was prepared by the investigators in the field in an Arabic to gather demographic and clinical information from schizophrenic patients, including information about their age, gender, educational status, marital status, profession, age at diagnosis, mode of admission, and use of antipsychotic medication.

Tool II: Toronto Alexithymia Scale (TAS-20) was designed by (Bagby et al. 1994) to assess emotion awareness. It consists of 20 items that take approximately 5–10 minutes to complete. TAS-20 is conceptually divided into three subscales; seven elements for difficulty identifying feelings (DIF); five elements for difficulty describing feelings (DDF), and eight elements for externally oriented thinking (EOT). Each statement is followed by a rating of participants' level of agreement or disagreement (1 = "strongly disagree" to 5 = "strongly agree"). It has appropriate psychometric qualities and is a straightforward, reliable, and condensed scale. Higher scores on the scale demonstrate lower functioning, with the total score ranging from 20 to 100.

Cut off value of alexithymia score

No alexithymia ≤ 51

Border alexithymia 52-60

Alexithymia ≥ 61

Tool III: Emotion Regulation Questionnaire (ERQ) was created by (Gross & John, 2003) and translated into Arabic (El-Azzab, et al., 2022) to assess participants' tendency to regulate their emotions. It includes 10 items that take approximately 5–7 minutes to complete and provides information concerning emotion regulation techniques. 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 are requested to select from 1 to 7 (1 = "strongly disagree", 7 = "strongly agree"). The total scores of the seven-point scale range from 10 to 70; higher score indicates a greater tendency to use that strategy.

Tool IV: The Social Functioning Questionnaire (SFQ) was created by Paul et al., (2003) and translated into Arabic by (Abd EL et al., 2017) to assess the patient's social functioning. It consists of 40 items that take approximately 15–20 minutes to complete. It is divided into five categories namely, self-care skills, domestic skills, community skills, social skills, and responsibility; each containing eight elements. Answers are given on a 4-point Likert scale, with one denoting incompetence and four denoting competence. The possible total scores range from 40 to 160. The points are summated for each category. High functioning is defined as an average score of 3.8 or higher, intermediate functioning as an average score of 3.2 to less than 3.8, low functioning as an average score of 2.4 to less than 3.2, and poor functioning as a mean score of less than 1.4.

The conceptual framework in **Figure I** below displays the interaction effect between Alexithymia symptoms and emotion regulation in predicting social function among studied schizophrenic patients during the program.

Tools validity:

The tools were rigorously reviewed by a panel of five experts in the field of Psychiatric and Mental Health Nursing, to know items' phrasing, form simplicity, terms, sequences, applicability, and importance. The present study tools contained proper data that was related to the study's objective according to the jury members' opinion to assess the items' internal consistency that make up all research tool

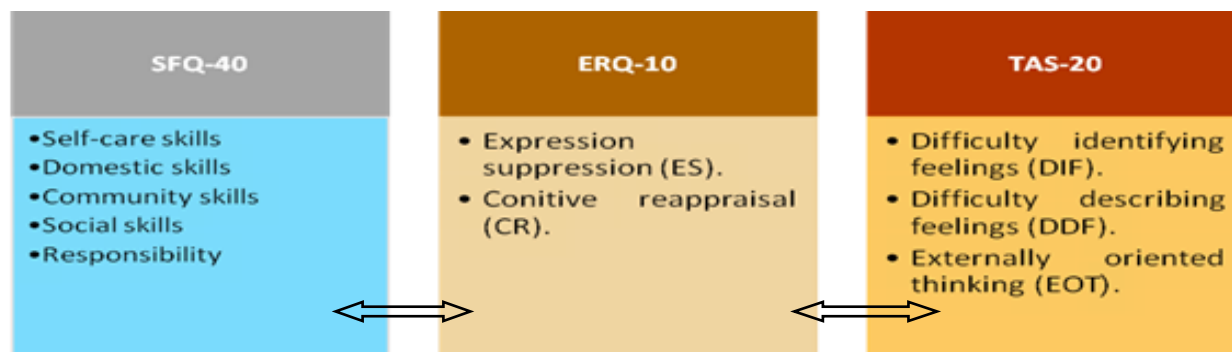


Figure (1): The interaction effect between TAS and ER in predicting SFQ of studied schizophrenia patients during the program

Tools reliability:

The reliability of the scale and questionnaires was assessed through testing their internal consistency. They showed very good reliability, with Cronbach's alpha coefficients; 0.83 for the alexithymia, 0.82 for emotion regulation, and 0.92 for social function.

Pilot Study:

Pilot testing of the research tools involved the recruitment of six schizophrenic patients, or 10% of the overall schizophrenic patients. The tools were tested for applicability, comprehensiveness, clarity, time spent in filling out, as well as for the study process feasibility. The pilot subjects were not included in the main study sample.

Administrative Study and Ethical Considerations

The researchers requested permission to conduct the research from the Director of the chosen hospital by submitting an official letter from the Dean of the Faculty of Nursing at Zagazig University. The letter included a copy of the forms used to collect data as well as explanations of the study objectives and methods. The study was then officially approved by the Scientific Research Ethics Committee, Faculty of Nursing, Zagazig University (ID/Zu.Nur.REC#:0074). Patients' consent to participate in the study was obtained, and they were informed about their right to discontinue the study at any time without providing a reason or harming the offered services they were receiving at the time of withdrawal or those provided in the follow-up. The study did not cause any negative consequences to the studied patients, and they have been assured that the data collected will solely be utilized for research purposes

Fieldwork:

The present study included five stages: preparation, assessment, planning, implementation, and evaluation.

Preparation phase:

The relevant studies linked to the research topic were reviewed utilizing textbooks, papers, and periodicals to gain a clear image of the study components. In this phase, the Research Ethics Committee, Faculty of Nursing, Zagazig University, provided the required

approval and authority to perform the study. To determine the relevance of the tools and EARNIP for the study objectives, a panel of seven experts in relevant domains, including mental nursing and psychiatric medicine, tested the tools and EARNIP and evaluated their validity. The Lawshe Content Validity Ratio was 1 and higher than 0.99, which implies that the tool's content was valid. Moreover, the comprehensiveness, clarity, feasibility, applicability, and relevance of the tools were evaluated, and the time needed to fill each one was estimated through a pilot study performed on six patients who were not part of the study to prevent study sample contamination. Then, the necessary modifications were made accordingly. This phase started from January to May 2022.

Assessment (Pretest) phase:

The data were collected using the study tools via individual interviews. As a pre-intervention assessment, this phase provided the data to determine the needs of study participants. The questionnaire completion process took 25 to 35 minutes. This phase started from June to November 2022.

Planning phase:

EARNIP was designed by the researchers following relevant literature reviews from textbooks and scientific journals [Igra et al., \(2023\)](#); [Berglund et al., \(2023\)](#); [Moore, et al., \(2022\)](#); [Kimhy et al., \(2016\)](#), the findings of the assessment phase, priorities, goals, and 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. Ten categories were created from the studied patients, with each subgroup containing six patients to encourage interaction and practice. As stated in Table I, the program was designed to be completed in ten sessions, each lasting between 45 and 90 minutes, once a week

Table (I): Description of sessions, objectives, duration, and content of nursing intervention program developed in this study.

Session	Composition	Time	Contents
1	Introductory session	45 min.	<ol style="list-style-type: none"> 1- Establishing rapport between the researchers and participates 2- Issues of confidentiality. 3- Defining the objective, plan, and program content as well as introducing the participants and investigators to one another. 4- Introducing basic rules for each group. 5- Assessing the studied patients' own emotions.
2	Emotional perception training	60 min.	<ol style="list-style-type: none"> 1- Recognizing emotions and emotional words. 2- Delivering feedback on the session and directions for the following one.
3	Emotional perception training	90 min.	<ol style="list-style-type: none"> 1- Linking emotional words with facial expressions. 2- Perceiving emotions in a context and distinguishing feelings based on facial expressions. 3- Giving feedback on the session and guidance for the following one.
4	Emotion expression	90 min.	<ol style="list-style-type: none"> 1- Conveying your primary emotions (i.e., fear, anger, hate, sorrow, happiness, amazement). 2- Role-playing via expressing emotions to another person while conversing with them. 3- Giving feedback on the session and directions for the following one.
5	Emotion expression.	90 min.	<ol style="list-style-type: none"> 1- Expressing emotions using written instructions. 2- Role-playing using facial expression relay, which involves identifying one's facial expression and relaying it to the following participant. 3- Giving feedback on the session and directions for the following one.
6	Emotion usage and application	90 min.	<ol style="list-style-type: none"> 1- Ways of understanding others' emotions. 2- Conveying others' emotions using mood masks. 3- Giving feedback on the session and directions for the following one.
7	Emotion usage and application.	90 min.	<ol style="list-style-type: none"> 1- Understanding complex emotions. 2- Promoting the capacity to transform emotions and find happiness via providing others with constructive comments and positive feedback. 3- Giving feedback on the session and directions for the following one.
8	Emotional control and regulation	90 min.	<ol style="list-style-type: none"> 1- The patient asks him/herself: Who am I? (Develop self-awareness). 2- Constructing the tools and techniques required to control one's emotions while establishing a new future inspired by experiences. 3- Giving feedback on the session and directions for the following one.
9	Emotional control and regulation.	60 min.	<ol style="list-style-type: none"> 1- Recognizing and expressing depressed moods. 2- Understanding and managing all negative emotions, including wrath, fury, and anxiety.
10	Wrapping up the intervention program and demonstrating post-test.	60 min.	Providing a summary of all program sessions, supplying patients with a chance to express the benefits of the program, and conducting post-tests.

Implementation phase:

- The researchers carried out EARNIP, which has a general objective of improving participants' emotion awareness, emotion regulation, and social function. **Figure II** was prepared by the researchers for a straightforward presentation of the intervention program sessions.
- The researchers designed an explanatory PowerPoint presentation and handouts of individual EARNIP sessions supplemented with pictures and graphics to help the participants understand the content. Also, they organized the sessions to explain each session and address the study participants' inquiries.
- Each session began with a review of the material from the preceding session and a discussion of the assigned readings. A conversation followed the

- session's content, preceded by psychoeducation, and illustrated via role-playing and video vignettes.
 - An overview and a homework task were given at the end of each session.
 - The research team created reminiscence psychotherapy for the study subjects by requesting them to discuss their experiences of emotions and behave as a support network for one another. This was done to encourage study patients to engage and feel comfortable during sessions.
 - Furthermore, the research team implemented the program with each subgroup for one session/week for ten weeks (Monday) during the morning shift in the T.V. room in the psychiatric wards.
- Data collection for this phase started from December 2022 to February 2023 once a week, and the total duration of data collection was ten weeks

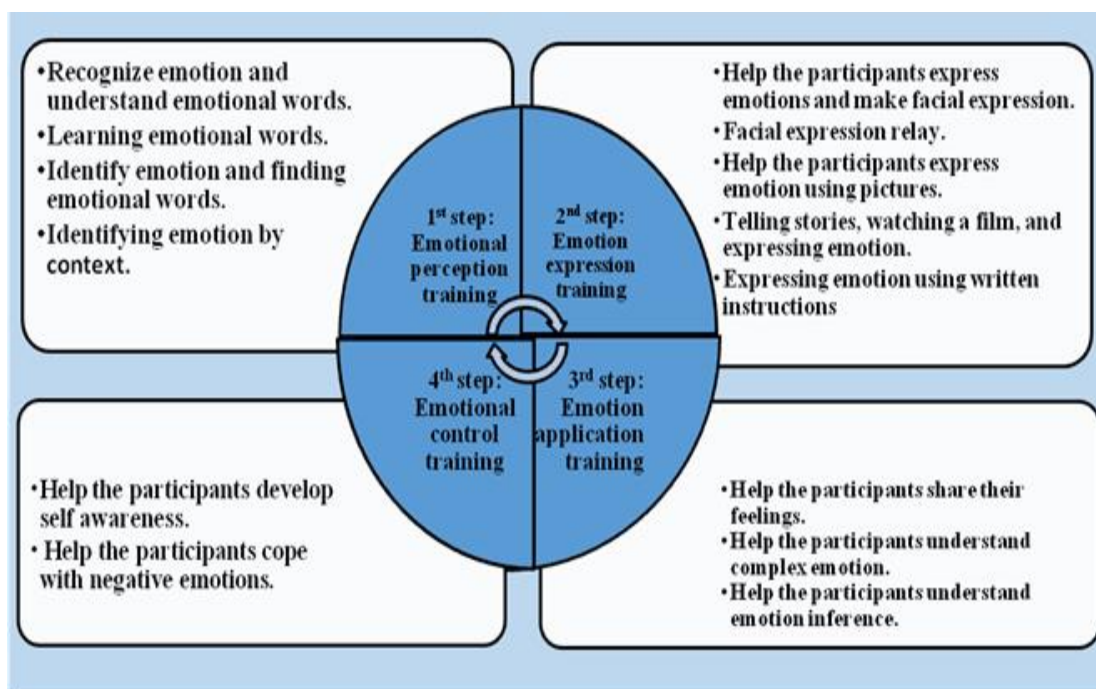


Figure (2): Presentation of the intervention program sessions

Evaluation phase:

The objective of this phase was to assess the influence of EARNIP on the social functions of patients with schizophrenia. The posttest employing tools II, III, and IV was introduced by the researchers just after the study intervention program was put in place. The data-gathering procedure for this phase began in February 2023. Utilizing appropriate statistical analysis, the suggested interventions were assessed.

Statistical analysis

The mean, standard deviation (SD), and range were used to present quantitative data. Numbers and percentages were used to convey qualitative data. The differences between measurements taken before and

after the intervention were analyzed using the paired t-test, which was used to compare two pairs of normally distributed variables. The paired ordinal data were compared using the marginal homogeneity test. To evaluate the relationships between the variables under study, Pearson's correlation coefficient was estimated. Values close to one reflect high association, whereas values close to zero imply poor correlation. Positive values represent a direct correlation, while negative values indicate an inverse correlation. P values less than 0.05 were regarded as statistically insignificant, while those greater than 0.05 as statistically significant. All statistical analyses were carried out using the IBM SPSS Statistics software program, version 23.0

Results :

Table (1): Frequency and distribution of studied patients according to demographic characteristics (n=60).

Demographic characteristics	N.	%.
Age (years):		
- 20 - <30	10	16.7
- 30 - <40	18	30.0
- ≥40	32	53.3
	Mean ± SD 40±8.7	
	Median (Range) 40 (25-56)	
Gender:		
- Male	46	76.7
- Female	14	23.3
Educational level:		
- Basic education	28	46.7
- Secondary education	21	35.0
- University education	11	18.3
Marital status:		
- Single	20	33.3
- Married	17	28.3
- Divorced	22	36.7
- Widow	1	1.7
Working status:		
- Not working	34	56.7
- Working	26	43.3

Table (2): Frequency and distribution of studied patients according to clinical characteristics (n=60).

Clinical characteristics	N.	%.
Age at diagnosis:		
- 18-<25	43	71.6
- ≥25	17	28.4
	Mean± SD 21.1±2.7	
	Median (Range) 20 (18-27)	
Frequency of hospital admission:		
- One	13	21.7
- Two	30	50.0
- Three	12	20.0
- Four	3	5.0
- More than four	2	3.3
Pharmacological treatment:		
- Yes	60	100.0
- No	0	0.0
Psychotherapy treatment:		
- Yes	37	61.7
- No	23	38.3

Table (3): Pre-post intervention program changes in patients' scores of alexithymia and emotional regulation (n=60).

Scores of	Pre intervention (n=60)	Post intervention (n=60)	Paired t	P value
	Mean ± SD	Mean ± SD		
Alexithymia Subscales				
Difficulty identifying feeling	2.2±5.4	17.4±4.6	10.1	0.0001*
Difficulty expressing feeling	15.3±2.3	13.7±1.8	5.9	0.0001*
Externally oriented thinking	24.2±3.1	24.5±2.5	1.2	0.0001*
Total Alexithymia	61.7±7.9	55.6±5.9	4.5	0.0001*
Emotional regulation domains				
Cognitive reappraisal	25.2±5.8	27.02±5.81	2.2	0.029*
Expression suppression	15.9±4.3	12.9±3.3	3.4	0.0001*

* Significant at P ≤ 0.5, highly significant at P ≤ 0.01

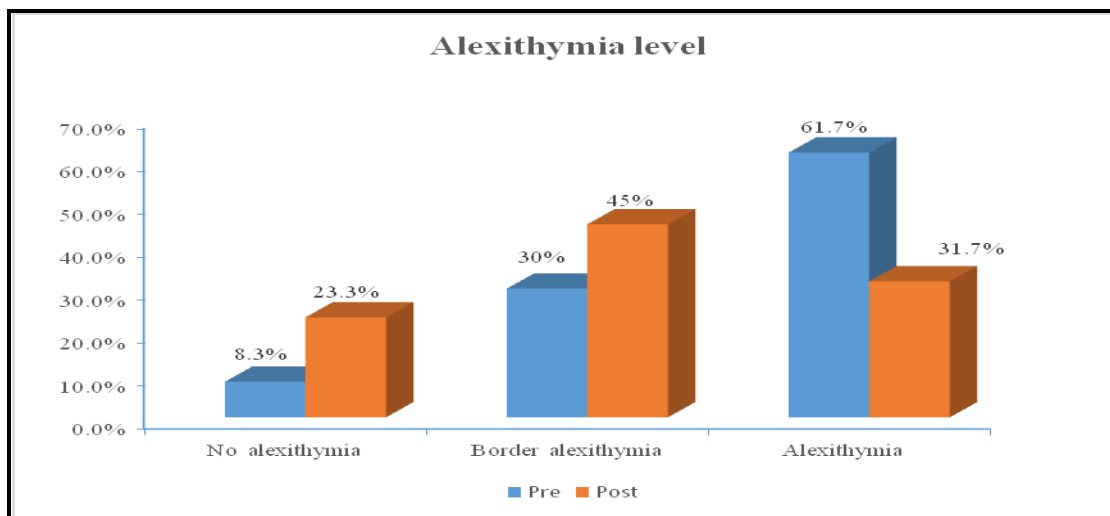


Figure (1): Pre-post intervention program changes in patients' scores of alexithymia levels (n=60).

Table (4): Pre-post intervention program changes in patients' scores of social function (n=60).

Categories	Levels of the social function of studied patients								Mean± SD	p-value
	High		Moderate		Low		Poor			
	No.	%.	No.	%.	No.	%.	No.	%.		
Self-care										
Pre	19	31.7	21	35.0	20	33.3	0	0.0	24.7±5.9	0.0001*
Post	35	58.3	20	33.3	5	8.3	0	0.0	28.1±4.8	
Domestic										
Pre	10	16.7	5	8.3	29	48.3	7	11.7	17±6.2	0.01*
Post	15	25.0	9	15.0	18	30.0	11	18.3	18.4±7.2	
Community level										
Pre	5	8.3	23	38.3	25	41.7	7	11.7	18.8±4.6	0.0001*
Post	8	13.3	27	45.0	24	40.0	1	1.7	20.3±4.7	
Social level										
Pre	10	16.7	28	46.7	18	30.0	4	6.7	21.3±5	0.0001*
Post	27	45.0	19	31.7	14	23.3	0	0.0	23.5±4.6	
Responsibility level										
Pre	8	13.3	28	46.7	24	40.0	0	0.0	20.4±4.3	0.0001*
Post	15	25.0	32	53.3	13	21.7	0	0.0	22.5±3.9	
Total social function										
Pre	0	0.0	34	56.7	26	43.3	0	0.0	102±19.8	0.0001*
Post	12	20.0	32	53.3	16	26.7	0	0.0	112.8±20.6	

Marginal Homogeneity Test,

* significant at p ≤ 0.5, highly significant at p ≤ 0.01

Table (5): Correlation matrix of various scores of studied schizophrenic patients pre and post intervention program.

Total Scores	Alexithymia		Cognitive reappraisal		Expression suppression		Social function	
	r	P	r	P	r	P	r	P
Alexithymia								
Cognitive reappraisal	0.086	0.512						
Expression suppression	0.375	0.003**	0.420	0.001**				
Social function	-0.301	0.019*	-0.169	0.197	-0.433	0.001**		

(r) Pearson correlation coefficient,

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Table (6): Best fitting multiple linear regression model for the studied variables score.

Scores of	Unstandardized Coefficients		t-value	P value	r	R ²
	B	SE				
Social function						
(Constant)	150.2				0.68	0.47
Expression suppression	-2.07	0.496	4.185	0.0001**		
Education level	- 5.07	2.172	2.333	0.023*		
Frequency of hospital admission	-3.71	1.665	2.227	0.030*		
β = regression coefficients, SE: standard error, R square = 47% of predictors, F test = 12.3 *Significant (P < 0.05). ** Highly significant (P ≤ 0.01). Variables entered and excluded: age, gender, marital and occupational status, and age at diagnosis.						
Cognitive reappraisal						
(Constant)	28.9				0.48	0.23
Frequency of hospital admission	-2.57	0.635	4.041	0.0001**		
Occupational level	3.57	1.510	2.368	0.021*		
β = regression coefficients, SE: standard error, R square = 23% of predictors, F test = 8.4 *Significant (P < 0.05). ** Highly significant (P ≤ 0.01). Variables entered and excluded: age, gender, educational level, marital status, and age at diagnosis.						
Expression suppression						
(Constant)	24.1				0.63	0.4
Social function score	-0.110	0.025	4.476	0.0001**		
Frequency of hospital admission	-0.727	0.388	1.973	0.049*		
Educational level	-1.174	0.503	2.333	0.023*		
Alexithymia score	0.126	0.060	2.079	0.042*		
β = regression coefficients, SE: standard error, R square = 40% of predictors, F test = 9.2 *Significant (P < 0.05). ** Highly significant (P ≤ 0.01). Variables entered and excluded: age, gender, marital and occupational status, and age at diagnosis.						

Table (1): Showed that the studied patients age ranges between 25 to 56 years old with mean age was 40±8.7 years, with 76.7 % being males. Regarding the marital status, more than one-third of the participants were divorced (36.7%). For the educational level, 46.7% of the subjects had basic education, while 56.7% were unemployed.

Table (2): Indicates that the age of studied patients with schizophrenia at diagnosis ranged from 18 to 27 years old with a mean ± SD of 21.1 ± 2.7. Considering the number of previous admissions, half of the patients were admitted to the hospital for the second time. Moreover, all patients were treated with pharmacological treatment modality, and 61.7% of them received psychotherapy.

Table (3): Reveals that the total mean score of alexithymia among studied patients before the program was 61.7±7.9, which decreased to 55.6±5.9 after the program with P value of 0.0001. While the total mean score of the cognitive reappraisal domain was 25.2±5.8 before the program, which increased to 27.02±5.81 after the program. As well as the total mean score of the expression, suppression domain among studied patients was 15.9±4.3 before the program, which decreased to 12.9±3.3 after the

program with P value of 0.029 and 0.0001, respectively.

Figure (1): Illustrates that before the intervention program, 61.7% of studied schizophrenic patients were alexithymia, 30% had border alexithymia, and 8.3% were not alexithymia compared to 31.7%, 45%, and 23.3%, respectively post-intervention program.

Table (4): Reveals a highly significant difference between the total mean scores of all social function domains in the pre and post intervention program. The total mean score of the social function was 102±19.8 before the intervention program, which increased to 112.8±20.6 after the intervention program whereas P = 0.0001.

Table (5): Table 6 indicates a moderately significant positive correlation between the alexithymia score and expression suppression score (r = 0.375, P = 0.003), and a significant negative correlation between the scores of alexithymia and social function (r = -0.301, P = 0.019) before and after the intervention program. In addition, there was a significant negative correlation between expression suppression and social function (r = -0.433, P = 0.001).

Table (6): Demonstrates that the frequency of hospital admission was a statistically significant

negative predictor for cognitive reappraisal scores after implementing the program ($P = 0.0001$). On the other hand, the patients' occupational level was a positive predictor. It explained 23% of the variation in this score. Otherwise, there were no other parameters that had any significant influence on cognitive reappraisal scores. As for the expression suppression score, the same table illustrates that the social function score, frequency of hospital admission, and patients' education level score were statistically significant independent negative predictors. On the other hand, the total alexithymia score was a statistically significant positive predictor. It explains 40% of the variation in this score. Otherwise, there were no other parameters that had any significant influence on expression suppression

Discussion

Emotion regulation plays an essential role in social interactions among patients with schizophrenia. By applying a variety of emotional management techniques, it is possible to adapt emotional reactions to situational demands. The most well researched emotional regulation techniques are cognitive reappraisal and expressive suppression **Berglund, et al., 2023**).

According to a prior study, people with schizophrenia have difficulties controlling their emotions, which has an impact on how well they operate in social situations **(Stephanou et al., 2017)**. Therefore, the current study aimed to explore the effectiveness of the nursing intervention program based on emotional awareness and emotion regulation on the social functioning of schizophrenic patients.

The results of the present study showed that half of the participants were admitted to a mental health hospital for a second time. This finding may be due to the patients not following their treatment plan and inconsistent follow-up. In the current study, frequent hospital admission was an independent negative predictor for cognitive reappraisal and social function scores; this implies that frequent hospitalization has a detrimental impact on social function. Also, more than two-thirds of participants in the current study were single or divorced; therefore, there was no support or follow-up. This result agreed with the findings of **(Jung et al. 2021)** in Korea and **(El-Azzab, et al., 2022)** in Egypt who stated that more than two-thirds of participants were single. In this context, a study by **Donisi et al. (2016)** demonstrated that failure of the previous hospital admission, non-adherence to medicine owing to forgetfulness or financial constraints, lack of family support, or having no family are the main reasons for readmission.

According to the current study, patient's ability to control their emotions significantly improved right away after the intervention program was put into action. This outcome may be attributable to the skills the participants acquired, including a variety of exercises created to allow patients to acquire and utilize multiple emotional skills, such as conveying emotions through eye contact, facial expressions, speech, and behaviors. The patients were also taught how to deal with adverse feelings, such as rage, anxiety, and depression.

Additionally, these exercises included appealing and interesting materials for the patients that help with skill acquisition such as pictures, emotions cards, videos, cartoons, and telling stories with a variety of emotions, as well as training techniques like creating masks that express a specific emotion, role-playing and supportive reinforcement for the desired emotion. This result denotes that training patients to express emotions by mimicking various facial expressions, repeating the use of emotional words, and expressing emotions through various words is effective.

This result was congruent with a study conducted by **(Opoka, et al., 2021)** in Germany and **Moore, Rebekah, et al., (2022)** in the United Kingdom, who reported that participants' emotion dysregulation reduced after the intervention program. Additionally, **Cho & Jang (2019)** noted that the experimental group's ability to recognize, express, and articulate emotions had greatly improved following the emotion management program.

Besides, **Gil-Sanz et al., (2016); Lu et al., (2022)** stated that the psycho-educational program significantly improved emotional regulation reappraisal, facial expression sensitivity, emotional attention, emotional clarity, and assertive anger expression. Furthermore, **Khakbaz et al., (2022)** revealed that acceptance and commitment therapy was effective in enhancing emotion regulation, suggesting a decrease in emotional disorders caused by psychosis and acknowledgment of emotions

Similarly, **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. However, **(Lam, et al., 2020)** reported that mindfulness-based programs effectively enhance emotion regulation.

Concerning alexithymia, the present study revealed reductions in difficulty identifying feelings, difficulty expressing feelings, and total alexithymia scores after the intervention program among patients with schizophrenia. Therefore, the present intervention program can be employed to help schizophrenic

patients learn how to recognize their emotions and communicate them. Separating participants into small groups also increased group discussions, improved experience sharing, enriched sessions with a useful and exciting ambiance, and gave research participants enough time to benefit from the program material. Patients could employ emotion regulation tactics such as managing their negative feelings, regulating their displeasure during interpersonal confrontations, or deflecting attention from a troublesome scenario after completing the program's intervention sessions. This suggests that this program may be utilized in nursing intervention to encourage patient emotional identification and expression, which usually restricts the frequency of admission for schizophrenic patients. This result agrees with **Larsson, et al., (2020)** in Sweden who found a statistically significant reduction in alexithymia score and an increase in emotional awareness, and emotion regulation after program intervention, which could be due to the repeated practices of identifying, labeling, and describing the emotions in skills training. Additionally, **Hsu & Ouyang (2021)** stated that the intervention program may have valuable benefits on alexithymic features and emotion-regulating capacity when used in conjunction with psychiatric standard care. Additionally, this intervention gave patients greater control over managing their alexithymia. Furthermore, **Salles et al., (2023)** claimed that different emotion regulation techniques help participants to manage alexithymia. In this regard, **(Gado, et al., 2022)** demonstrated that applying the intervention program enhanced the participants' emotional expression and recognition scores instantly and three months later. However, patients more sensitive to social rewards had more optimistic expectations, motivating them to promote more positive emotions than others **(Crawford et al., 2020)**.

Also, the current study findings revealed that alexithymia levels decreased after the intervention program. This corresponds with a study executed in Lebanon by **Obeid et al., (2022)** who found that applying a stress management program had an impact on lowering the level of alexithymia and enhancing emotional expression in their study group.

Regarding social function, the current study revealed that the social function scores improved immediately after implementing the emotion regulation training, which included all the domains of social function such as self-care, domestic, community level, and responsibility level. This improvement was an independent predictor for expression suppression, education level, and frequency of hospital admission. This may be attributed to the fact that the intervention program supports the patient's emotional behavior in

terms of emotion recognition, explanation, and control, as well as the understanding of other people's emotions, which improves interpersonal interactions. As a result, the influence of nursing intervention programs for emotion awareness and management broadens a person's social, physical, and recreational abilities, which reduces withdrawal, encourages motivation, and raises social competence.

The prior finding was concurrent with **Abd EL Aziz, et al., (2017)** in Egypt and **Gautham, et al., (2020)** in India who indicated a significant advancement in social function after social skills training and emotional expression sessions. In this regard, a study done in the United Kingdom by **Javed & Charles (2018)** reported an association between social functioning and the ability to identify, describe, express, and manage emotions.

In the same line, **Granholm et al., (2021); Lu et al., (2022)** concluded that psychosocial intervention was a crucial element in caring for schizophrenic patients, especially in relieving unfavorable and psychotic manifestations and improving social functioning. Furthermore, a study done in Egypt by **Abo-Elyzeed et al., Harfush (2019)** concluded that solving common social issues and building social skills by teaching patients to understand other people's emotions is possible.

Additionally, **Abdelsalam & Mohamed, (2017)** in Egypt and **Favrod et al., (2019)** in France, revealed that the goal of the positive emotions program for schizophrenic patients who have improved social functioning was to raise the frequency, length, and magnitude of pleasant emotional experiences as well as to enhance positive functional attitudes. These strategies involve recalling pleasant memories and predicting them, conveying feelings via nonverbal behaviors, paying careful attention to positive events as they occur, and exchanging positive experiences with others.

Qu et al., (2017) stated that awareness of one's emotions aids in a person's comprehension, foresight, and management of their states to adapt to various social situations. In parallel, a study done in London by **Lawlor et al. (2022)** exhibited high satisfaction and significant enhancements in comprehending and handling emotions with a positive influence on the social functions of participants, such as self-care, community, and responsibility level.

Such a result was consistent with **(Ahmed, et al., 2021)** who proved that rehabilitation programs were effective in enhancing the social functioning of schizophrenic patients, which offers a non-stigmatizing, safe, and nearly side-effect-free intervention. In addition, **Uzun & Lok (2022)** reported that emotional awareness skill training could

enhance emotional and social awareness, communication skills, and acceptance.

Regarding the correlation between the total score of alexithymia, expression suppression, and the total score of social function before and after the program, the current findings indicated a highly significant negative correlation, meaning an improvement in the social function of patients when their alexithymia symptoms decrease. As a result, people experiencing alexithymia become completely withdrawn inside themselves and show little curiosity in the environment or even in their own bodies, which leaves them feeling empty.

The resulting correlation was consistent with the findings of **Molnar et al (2020)** who discovered that patients with prevailing negative symptoms lose their enthusiasm, are unable to function in their homes, in the workplace, or classroom, and their relationships with others significantly deteriorate as a result of emotional limitations, poor speech, decreased interests, loss of sense of purpose, and lowered sense of social drive, which virtually increase their social deficiencies. Additionally, **Abdelgelil et al., (2022)** reported a very statistically significant negative association between the levels of social skills and adverse symptoms.

The outcome of the current study revealed a moderately significant positive correlation between alexithymia score and expression suppression score. This means that the patients use the emotional regulation strategy, "expressive suppression" to regulate emotions. Because they frequently struggle to identify their feelings, schizophrenic individuals with alexithymia choose to utilize response-focused emotion control when faced with challenging circumstances rather than antecedent-focused emotion control automatically. Thus, cognitive reappraisal can help schizophrenia patients lessen the severity of their unpleasant feelings. This result agrees with the research accomplished in Mexico by **Olalde-Mathieu et al., (2021)** who noted that expressive suppression scores were positively correlated with alexithymia score.

Additionally, a weak negative correlation was discovered between cognitive reappraisal and patients' age before the program compared with a moderate positive correlation between cognitive reappraisal and expression suppression after the program. This may be due to the age at diagnosis ranging between 18 to 27 in the current study. It looked at the two emotional control mechanisms in schizophrenic patients: cognitive reappraisal and suppressed expression. Expression suppression has an impact on the late stage of emotion formation, whereas cognitive reappraisal impacts the initial phase. This may contribute to the success of

psychological treatments and programs that instruct schizophrenia patients on how to control their emotions.

This result is consistent with **El-Azzab, et al., (2022)** who showed that people with shorter illness durations less than five years have higher average social function scores than people with prolonged illnesses and that there is a significant inverse association between total social function score and illness duration prior to the program. This may be explained by the fact that schizophrenia is a persistent severe mental condition, both due to its distinctive symptoms and to the vulnerability of its victims to environmental factors. As a result, patients are less able to engage in communal events like parties and peer groups as their disease lasts longer.

Conclusion

The present study concluded that the nursing intervention program based on emotional awareness and regulation effectively improved emotional regulation and social function, and reduced the level of alexithymia among studied patients with schizophrenia.

Recommendations:

The following recommendations are suggested in light of the results of the present study:

- Launching advocacy campaigns to raise patients' awareness about the significance of the rehabilitation stage of schizophrenia, which aims to provide them with the skills to manage their emotions and function socially.
- Establishing training programs for psychiatric mental health nurses to use programs to assist patients in developing social skills and self-control to engage in acceptable social relationships.
- It is essential to widen the scope of this study by including more participants and mental disorders other than schizophrenia.
- Due to their impact on improving alexithymia, emotion awareness, emotional control, and social interaction in schizophrenic patients, social skill training programs should be regarded as a significant modality in everyday practice in addition to pharmacological therapies.
- Additional studies are required to determine the elements influencing the transfer of newly acquired capabilities from therapeutic settings to real-life circumstances as well as the generalizability of social skill training in everyday contexts.
- Mental health institutions should utilize educational programs and offer them to all psychiatric inpatients and outpatients to improve their awareness and regulation of their emotions.

- Social skills programs should be incorporated into the hospital's protocol of care alongside pharmacological treatment to extend the standard of care for schizophrenia patients.

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Conflict of interest

There is no conflict of interest.

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