

## Effect of a Brief Mindfulness-Based Intervention on Emotional Regulation and Mindfulness Levels in Patients with a Schizophrenia Spectrum Disorder

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### Abstract

**Background:** Mindfulness is the practice of purposely bringing one's attention to the present moment without evaluation, a skill one develops through meditation or other training. **Subjects and Method:** The present study aims to examine the effect of a brief mindfulness-based intervention on emotional regulation and levels of mindfulness among patients with a schizophrenia spectrum disorder. A quasi-experimental study design was used. Convenient sampling was applied to recruit fifty schizophrenic patients from the psychiatric health and addiction treatment hospital in Port Said City. The data were collected through two tools including the mindfulness scale and the difficulties in emotion regulation scale, in addition to the personal and clinical datasheet. The sample was assessed before the training program and immediately after finishing the program. **Results:** The study revealed that there was a statistically significant negative correlation between patients' levels of mindfulness and difficulties in emotion regulation. A significant improvement in the high level of mindfulness in the post-program phase. **Conclusion:** The current study illustrated that the best predictors for mindfulness among the studied patients are educational level, marital status, family income, and the beginning of the disease. **Recommendation:** Mindfulness-based intervention program for schizophrenia spectrum patients' care is recommended as a non-invasive, non-pharmacological, inexpensive, and cost-effective method without complications.

**Keywords:** Emotional regulation, Mindfulness & Schizophrenia spectrum disorder

### Introduction

The schizophrenia spectrum is the most serious mental disorder, necessitating ongoing care in a variety of aspects. Disturbing emotions, thoughts, perceptions, and behaviors are characterizing it. (Behrouian et al., 2021). Complex care needs are indicated if adverse effects of treatment, inadequacy, hopelessness, and non-adherence are addressed with these symptoms. (Demirel-Döngel et al., 2018).

Furthermore, research reveals that people with schizophrenia may be unable to regulate their emotions, having emotion dysregulation evident at the experiencing, processing, and expressive levels, aggravating the suffering and social dysfunction (Khoury & Lecomte., 2012). Emotional dysregulation in schizophrenic patients is examined and the importance of emotional experience in the etiology and progression of the condition. In line with the literature, they argue that emotion regulation strategies such as reappraisal, exposure, acceptance, detachment, and mindfulness should be prioritized in cognitive behavior therapy for schizophrenia. They also emphasize the importance of incorporating emotion awareness and regulation difficulties into the development of treatment models and interventions

for psychosis. Emotion dysregulation has emerged as a transdiagnostic factor that may increase the risk of psychosis onset, maintenance, and relapse (Kimhy et al., 2020).

According to previous research, schizophrenia patients may benefit from mindfulness-based interventions since they have lower self-reported mindfulness than controls and exhibit substantial relationships between mindfulness and psychological dimensions relevant to adaptive functioning. (Tabak et al., 2015). Mindfulness is the skill of focusing one's attention on one present moment without judgment, which can be achieved through meditation or other methods (Paulus., 2016). Clinical research has shown that mindfulness has physical and mental health advantages in a variety of patient categories, as well as in healthy adults and children (Dunning et al., 2019). Mindfulness appears to provide therapeutic efficacy for those with psychiatric problems as well. (Boyd et al., 2018; Goldberg et al., 2018; Tomlinson, et al., 2018).

The awareness that arises from paying attention to the current moment without judgment is described as mindfulness. It gently pulls the mind away from the unpleasant emotions brought on by the gap between

expectation and reality by focusing on the present moment rather than worrying about the future or lamenting the past. Only a few studies have looked at the effectiveness of employing a mindfulness-based intervention to improve emotion regulation in people with schizophrenia spectrum disorders. The Mindfulness-based psych education program seems to be beneficial for increasing emotion regulation, which will help confirm the treatment benefits in more diverse groups of schizophrenia patients. (Lam et al., 2020).

Nurses play a critical role in patient education, counseling, and rehabilitation, and their work is critical in the transition from a hospital-based to a community-based approach in the area of psychiatry. In general, nursing is thought to be founded on a humanistic approach to care. In this context, supplementing nurse-provided care with extra psychotherapies could help people live healthier lives. (Kavak & Yilmaz., 2018).

### Significance of the study:

Up to the researchers' knowledge, no clinical research is conducted in Egypt, to examine the effect of a brief mindfulness-based intervention on emotional regulation and levels of mindfulness among patients with a schizophrenia spectrum disorder. Moreover, in light of the significance of emotional intelligence considering how individual differences in emotion regulation strategies affect mental health and the widespread role of emotion dysregulation in a variety of psychopathological conditions, clinical interventions focusing on emotion regulation /dysregulation may have significant benefits for these psychological disorders. This hypothesis is supported by several numbers of research that show mindfulness-based interventions are especially beneficial in clinical and non-clinical conditions marked by distress and negative emotions. (Guendelman et al., 2017). So, this study aims to promote mindfulness among schizophrenic patients. Thus, the use of a mindfulness-based intervention program for psychiatric patients' care is recommended as a non-invasive, non-pharmacological, inexpensive, and cost-effective method without complications.

### Aim of the study

#### This study aims to:

Examine the effect of a brief mindfulness-based intervention on emotional regulation and levels of mindfulness among patients with a schizophrenia spectrum disorder.

#### The Objectives of this study are:

1. Determine the levels of mindfulness among patients with a schizophrenia spectrum disorder.
2. State the predictors for mindfulness among patients with a schizophrenia spectrum disorder.

3. Assess levels of difficulties in emotion regulation among patients with a schizophrenia spectrum disorder.
4. Construct, implement and evaluate the effect of a mindfulness-based intervention on emotional regulation among patients with a schizophrenia spectrum disorder.

### Research Hypotheses

Based on the goals of the research the following hypotheses have been tested.

1. The post-test scores for the level of mindfulness among patients with a schizophrenia spectrum disorder who attended a brief mindfulness-based intervention program may be higher than their pre-test scores.
2. The post-test scores for the levels of emotional regulation among patients with a schizophrenia spectrum disorder who attended brief mindfulness-based intervention programs may be higher than their pre-test scores.

### The conceptual definition of emotion regulation

The conceptual definition of emotion regulation on which the difficult in emotion regulation scale (DERS) is based emphasizes the functionality of emotions and focuses on adaptive ways of responding to emotional distress, including the: (a) awareness, understanding, and acceptance of emotions; (b) ability to control behaviors when experiencing negative emotions; (c) flexible use of situational-appropriate strategies to modulate the intensity and/or duration of emotional responses, rather than to eliminate emotions; and (d) willingness to experience negative emotions as part of pursuing meaningful activities in life.

### Subjects and Method

#### Study Design:

A quasi-experimental (pre/post-test) design was used to determine the effect of a brief mindfulness-based intervention program about mindfulness on emotional regulation for patients with a schizophrenia spectrum disorder in Port Said Psychiatric Health Hospital.

#### Study Setting:

The present study was implemented in Port Said Psychiatric Health Hospital. This hospital is affiliated with the General Secretariat of Mental Health and Addiction Treatment (GSMHAT), Ministry of Health and provides care to psychiatric and substance abuse patients. That hospital is composed of five in-patient psychiatric units including one unit in the men's department for substance abuse, two units for males, and two units for female patients. Additionally, one unit for children, and finally the outpatient clinic.

#### Study Subjects:

The study subjects comprised a convenient sample of fifty patients with a schizophrenia spectrum disorder

in Port Said Psychiatric Health Hospital.

The subjects of this study were selected according to the following criteria; patients with schizophrenia spectrum disorder, in the residual phase (free from current positive symptoms according to the psychiatrist assessment and diagnosis in the patient records) and who agree to participate in the study.

**Tools for Data Collection:** The study data were collected using the following tools:

**The tool I: Mindfulness Scale:**

It was developed by **Baer et al., (2006)**, in English language and translated into the Arabic language by the researchers. This scale consists of 39 statements. Each statement has five choices and a graduated scale of (1-5) representing the following categories, does not apply (1), rarely (2), sometimes applies (3), often (4), and applies a lot (5). The score range is 39-195 and the high scores indicate that the individual is highly mindful.

**Scoring System:**

**Observe items:**

1, 6, 11, 15, 20, 26, 31, 36

**Describe items:**

2, 7, 12R, 16R, 22R, 27, 32, 37

**Act with Awareness items:**

5R, 8R, 13R, 18R, 23R, 28R, 34R, 38R

**Nonjudge items:**

3R, 10R, 14R, 17R, 25R, 30R, 35R, 39R

**Non-react items:**

4, 9, 19, 21, 24, 29, 33

**Tool II: The Difficulties in Emotion Regulation Scale (DERS):**

It was developed by **Gratz, & Roemer (2004)** in English language and translated into the Arabic language by the researchers. The emotional regulation is a 36-item scale that measures the level of the difficulties in the emotional regulation of an individual. This five-point Likert-type scale does not apply (1), rarely (2), sometimes applies (3), often (4), and applies a lot (5). Scores range from 36 to 180. Higher scores indicate higher scores suggest greater problems with emotion regulation.

**Subscale Scoring:** The measure yields a total score (SUM) as well as scores on six sub-scales:

1. Non acceptance of emotional responses (NONACCEPT): 11, 12, 21, 23, 25, 29
2. Difficulty engaging in Goal-directed behavior (GOALS): 13, 18, 20R, 26, 33
3. Impulse control difficulties (IMPULSE): 3, 14, 19, 24R, 27, 32.
4. Lack of emotional awareness (AWARENESS): 2R, 6R, 8R, 10R, 17R, 34R
5. Limited access to emotion regulation strategies (STRATEGIES): 15, 16, 22R, 28, 30, 31, 35, 36
6. Lack of emotional clarity (CLARITY): 1R, 4, 5, 7R, 9

Total score: sum of all subscales

\*\*" R" indicates the reverse-scored item

\*\* In addition to the personal and clinical data sheet: A structured sheet was developed by the researcher in the Arabic language which was collected from patients. Personal characteristics included patient age, gender, marital status, level of education, job, income, and crowding index. Clinical characteristics include the beginning of disorders, beginning of treatment, times of hospital admission and last hospital admission

**The Reliability of the Arabic versions of the tools was as follow:**

	Cronbach's Alpha	No. of Items
Mindfulness Scale	0.885	39
Difficulties in Emotion Regulation Scale	0.849	36

**Pilot Study:**

In preparation for the actual study, a pilot study was implemented on 10 % (five patients) of the studied patients. It was done to ascertain the significance, clarity, and practicability of the used study tools, and to estimate the time required to fill in the study tools. The patients who encompassed the pilot study were excluded from the chief study sample to assure the stability of the results. Built on the findings of the pilot study, no changes were done to the study tools; the study tools were simple and clear. The pilot study was implemented from 24/5/2021 to 27/5/2021.

**Field Work:**

Preparation, data collection, implementation, and evaluation of a program persisted for five months from the first of June to the end of October 2021. The study moved out through four stages Assessment, Development of the educational program, implementation, and evaluation as follows:

**Phase one: - Assessment phase (pretest)**

Before starting up the program design and planning, the study tools were constructed, tested, and refined then applied to patients to assess their knowledge and skills about mindfulness. Collected data were analyzed to obtain baseline information about patients' knowledge and skills in mindfulness. The filling of the tools ranged from 15 to 20 minutes.

**Phase two: Development of the educational program**

- The educational program was developed by the researchers based on reviewing the recent related literature and the result of phase one. The program content was developed, and the content stressed mainly (theoretical knowledge about mindfulness and many skills that help to promote mindfulness and emotional regulation in patients with a schizophrenia spectrum disorder.
- Training sessions were held by researchers through lectures, discussions and group participation, and role-playing, at the end of each session, the

participants' questions were answered, and the beginning of the next session was accompanied by a review of the topics of the previous session. Multimedia facilities such as computers, film, and software players (PowerPoint) were used to provide training and prevent tiredness in the participants.

- The program was tested for its validity after translation by three linguistic experts.
- The program was developed on a small group basis. The researcher took 5 subgroups/ two days/week (on Wednesday & Thursday) from 9 am to 12pm.
- The subjects encompassed 5 subgroups. Each subgroup is composed of 8-10 patients. Each subgroup attended 8 sessions; these sessions were scheduled as 2 sessions per week for 4 weeks. The time for each session was about (60-90 m).

#### **Phase three: Implementation of education Program.**

The researchers divided the implementation phase of the program into four sessions: There are four key components in the program (Engagement and empowerment; mindfulness in daily living and problem-solving; mindfulness in illness management; equipment and preparing for the future). During the implementation of the program, in a general, the researchers were the initiator, and provider and encouraged of exchange knowledge, problems, and stressors between studied patients and researchers, and encouraged exploration of their issues and responses. They also acted as a group leader who operated as a facilitator, teacher, and trainer. The researchers allowed patients to think critically and give a wide range of their responses to the situations and analyze each one. All over the sessions, the researchers were motivating the patients to share in the discussion and emotionally rewarded them with positive comments and appreciation. In each session, the researchers gave the patients the chance to mention positive changes acquired from the previous sessions.

#### **Phase four (Evaluation phase)**

- This is concerned with the evaluation of the implemented educational Program. The tools of the study were reapplied twice to all study subjects on an individual basis.
- Immediately after the implementation of the educational program.
- After completion of the post-test, the studied patients were thanked for the time and effort they generously offered. Also, a printed booklet that included all information delivered in the program to use as a reference in the future was presented to each participant.

#### **Administrative Design:**

The dean of the Faculty of Nursing sent an official letter to the General Secretariat of Mental Health and

Addiction Treatment (GSMHAT), demanding his permission and cooperation to implement the study, afterward clarifying the intention of the study.

Consequently, official letters were directed from the General Secretariat of Mental Health and Addiction Treatment (GSMHAT) to the director of Port Said Psychiatric Health Hospital requesting his permission to conduct the study.

#### **Ethical Considerations:**

The study protocol was approved by the Scientific Research Ethics Committee of the Faculty of Nursing; Port Said University. Informed consent was obtained from the studied patients after a complete description of the purpose and nature of the study. Confidentiality of the collected data and anonymity were strictly maintained through a code number affixed to each studied patient's questionnaire. Voluntary participation of the studied patients was confirmed as they were well-informed that they have the freedom to withdraw from the study at any phase. Finally, the process of data collection and program implementation were not disturbing the harmony of the work of the above-mentioned settings.

#### **Statistical Design:**

##### **Statistical analysis of the data**

Data were fed to the computer and analyzed using IBM SPSS software package version 20.0. (Armonk, NY: IBM Corp). Qualitative data were described using numbers and percentages. The Shapiro-Wilk test was used to verify the normality of distribution. Quantitative data were described using mean and standard deviation. The significance of the obtained results was judged at the 5% level.

##### **The used tests were**

**Chi-square test** For categorical variables, to compare different groups

##### **Fisher's Exact or Monte Carlo correction**

Correction for chi-square when more than 20% of the cells have an expected count of less than 5

**Marginal Homogeneity Test** Used to analyze the significance of the different stages

**Paired t-test** For normally distributed quantitative variables, to compare two periods

##### **Limitations of the study:**

It was the first time applying for a program in a psychiatric hospital and the permission was gained with difficulty. Also, it was difficult to collect all the patients together at the same time to attend the session of the program. This was overcome by implementing the program for small groups of patients at the appropriate time for the researcher and the patient.

**Results:****Table (1): Distribution of studied patients according to their personal characteristics (n=50)**

Items	N	%
<b>Age:</b>		
28 – < 38	15	30
38 – <48	25	50
48 or more	10	20
Mean SD	41.40±6.77	
<b>Gender:</b>		
Male	19	38
Female	31	62
<b>Marital status:</b>		
Single	23	46
Married	19	38
Divorced	6	12
Widow	2	4
<b>Educational levels:</b>		
Not read and write	6	12
Read and write	10	20
Preparatory school	17	34
Secondary school	12	24
University	5	10
<b>Family income</b>		
Sufficient and save	2	4
Sufficient	21	42
Insufficient	27	54
<b>Job</b>		
Work	18	36
Not work	32	64
<b>Crowding index</b>		
1	4	8
2	30	60
3	16	32

**Table (2): Distribution of studied patients according to their clinical characteristics (n=50)**

Items	N	%
<b>Beginning of disorders:</b>		
< 3 years	8	16
3 to 6 years	23	46
>6 years	19	38
<b>Beginning of treatment:</b>		
< 3 years	7	14
3 to 6 years	29	58
>6 years	14	28
<b>Times of hospital admission</b>		
1 – 3	12	24
4 – 6	24	48
7 - 9	14	28
<b>Last Hospital admission:</b>		
> 3 months	7	14
3 to 6 months	17	34
>6 months	26	52

**Table (3): Distribution of studied patients according to difficulties in emotion regulation pre and post-intervention (n=50)**

Domains	Pre		Post		Chi-square P-value
	N	%	N	%	
<b>No acceptance of emotional responses</b>					
High	33	66	18	36	18.997 <0.01**
Moderate	10	20	16	32	
Low	7	14	16	32	
<b>Difficulty engaging in Goal-directed behavior</b>					
High	35	70	10	20	17.665 <0.01**
Moderate	9	18	25	50	
Low	6	12	15	30	
<b>Impulse control difficulties</b>					
High	34	68	9	18	19.100 <0.01**
Moderate	10	20	27	54	
Low	6	12	14	28	
<b>Lack of emotional awareness</b>					
High	36	72	11	22	16.007 <0.01**
Moderate	7	14	20	40	
Low	7	14	19	38	
<b>Limited access to emotion regulation strategies</b>					
High	30	60	10	20	17.111 <0.01**
Moderate	15	30	16	32	
Low	5	10	24	48	
<b>Lack of emotional clarity</b>					
High	31	62	13	26	18.070 <0.01**
Moderate	11	22	10	20	
Low	8	16	27	54	
<b>Total</b>					
High	32	64	12	24	22.334 <0.01**
Moderate	11	22	20	40	
Low	7	14	18	36	

\*Significant at  $P 0.05 \geq$ **Table (4): Distribution of studied patients according to Levels of Mindfulness among schizophrenic Patients pre and post-intervention (n=50)**

Domains	Pre		Post		Chi-square P-value
	N	%	N	%	
<b>Observation</b>					
Good	6	12	21	42	15.666 <0.01**
Moderate	14	28	20	40	
Poor	30	60	9	18	
<b>Description</b>					
Good	7	14	23	46	14.900 <0.01**
Moderate	12	24	17	34	
Poor	31	62	10	20	
<b>Aware actions</b>					
Good	6	12	20	40	19.804 <0.01**
Moderate	13	26	22	44	
Poor	31	62	8	16	

Domains	Pre		Post		Chi-square P-value
	N	%	N	%	
<b>Non-judgmental inner critic</b>					
Good	8	16	20	40	17.114 <0.01**
Moderate	17	34	21	42	
Poor	25	50	9	18	
<b>Non-reactivity</b>					
Good	7	14	19	38	16.200 <0.01**
Moderate	15	30	21	42	
Poor	28	56	10	20	
<b>Total</b>					
Good	6	12	21	42	20.134 <0.01**
Moderate	14	28	21	42	
Poor	30	60	8	16	

\*Significant at  $P 0.05 \geq$

**Table (5): Multiple Linear regression model for analyses predicting difficulties in emotion regulation (n=50).**

		Unstandardized Coefficients	standardized Coefficients		
		<i>B</i>	<i>B</i>	<i>T</i>	<i>P. value</i>
<b>Age</b>		.132	.093	1.761	.062
<b>Education level (High)</b>		-.290	.213	6.914	.009**
<b>Job (work)</b>		-.198	.112	2.878	.040*
<b>Family income (sufficient)</b>		-.087	.016	1.684	.071
<b>Marital status (married)</b>		-.201	.167	2.980	.041*
<b>Beginning of disease</b>		-.330	.286	8.045	.002**
<b>Beginning of treatment</b>		-.346	.293	9.332	.000**
<b>Last hospital admission</b>		-.211	.176	4.205	.031*
<b>Model</b>	<b>R<sup>2</sup></b>	<b>Df.</b>	<b>F</b>	<b>P. value</b>	
<b>Regression</b>	<b>0.58</b>	8	13.912	<b>.000**</b>	

\*Significant at  $P 0.05 \geq$

- a. Dependent Variable: difficulties in emotion regulation
- b. Predictors: (constant): Age, education level, Job, family income, marital status, the beginning of the disease, Beginning of treatment, and last hospital admission

**Table (6): Multiple Linear regression model for analyses predicting mindfulness among schizophrenic patients (n=50).**

		Unstandardized Coefficients	standardized Coefficients		
		<i>B</i>	<i>B</i>	<i>T</i>	<i>P. value</i>
<b>Age</b>		.098	.013	1.002	.069
<b>Education level (High)</b>		.366	.298	7.008	.007**
<b>Job (work)</b>		.250	.187	3.114	.042*
<b>Family income (sufficient)</b>		.401	.338	6.932	.008**
<b>Marital status (married)</b>		.301	.237	7.001	.007**
<b>Beginning of disease</b>		.299	.226	5.999	.009**
<b>Beginning of treatment</b>		.201	.158	4.771	.041*
<b>Last hospital admission</b>		.298	.203	4.087	.034*
<b>Model</b>	<b>R<sup>2</sup></b>	<b>Df.</b>	<b>F</b>	<b>P. value</b>	
<b>Regression</b>	<b>0.58</b>	8	13.912	<b>.000**</b>	

\*Significant at  $P 0.05 \geq$

- a. Dependent Variable: Mindfulness among Schizophrenic Patients
- b. Predictors: (constant): Age, education level, Job, family income, marital status, the beginning of the disease, Beginning of treatment, and last hospital admission

**Table (7): Correlations between studied variables pre-intervention**

		Mindfulness among Schizophrenic Patients
Difficulties in emotion regulation	r.	-0.657
	p	<0.01**

\*Slight significant <0.05\*

\*\*high significant if p value <0.

**Table (1):** Shows the personal characteristics of patients in the study sample. The mean age of the sample was 41.40±6.77 with half of the patients (50%) in the age group from 38 to less than 48 years, and 62% were female. Regarding their marital status, the table shows that the highest percentage of patients (46%) were single, while a great sector was married (38%). More than one-third of the sample (34%) had a preparatory level of education. As regards their job status the table also shows that 64% of the total sample were jobless. Speaking of patients' income, the table shows that 54% of the sample had insufficient income. As regards to crowding index, 60% of the sample had a high index of 2 persons/room.

**Table (2):** Shows the clinical characteristics of the patients in the study sample. About half of the patients (46%) have been ill for three to six years. As for the Beginning of treatment 58% of the patients had started treatment from three to six years. Out of the latter group, 48% were hospitalized four to six times. The last admission of 52% of them was more than six months.

**Table (3):** Denotes the percentage distribution of the difficulties in emotion regulation pre and post-intervention among studied patients pre/post program. It indicates the improvement of patients' difficulties in emotion regulation. As the scores in the pre-program tend to increase compared to the post-program total score in the moderate level of patients' difficulties in emotion regulation in the immediate post-test. Nonetheless, the difficulties in emotion regulation were significantly higher than the pre-program levels among studied patients.

**Table (4):** Shows the percentage distribution of the studied patients according to levels of mindfulness. It shows that there was a significant improvement between high levels of mindfulness in the post-program phase.

**Table (5):** Reveals multivariate linear regression for factor affecting difficulties in emotion regulation among the studied patients, as remarked, the strong factor affecting difficulties in emotion regulation among the studied patients was education level, beginning of the disease, and beginning of treatment as p=.009\*\*, .002\*\* & .002\*\* respectively. Followed by job, marital status, and last hospital admission at p 040\*, .041\* and .031\* respectively.

**Table (6):** Reveals multivariate linear regression for factor affecting mindfulness among the studied patients, as remarked, the strong factor affecting mindfulness among the studied patients was education level, marital status, family income, and beginning of the disease, as p=.007\*\*, .007\*\*, .008\*\* & .009\*\* respectively. Followed by Job, beginning of treatment and last hospital admission at p 042\*, .041\* and .034\* respectively.

**Table (7):** Submits the correlation between total mean scores of difficulties in emotion regulation and mindfulness among the studied patients' program. As described in the table, there was a statistically significant negative correlation between patients' levels of mindfulness with difficulties in emotion regulation at the post-program at p ≤ 0.01\*\*.

**Discussion**

The effectiveness of mindfulness-based therapies for stress reduction has been demonstrated in a broad body of literature. The benefits of a brief mindfulness-based intervention on emotional regulation, on the other side, are poorly understood. A mindfulness-based intervention for people with schizophrenia may improve emotional control, global functioning, and relapse prevention. However, there isn't enough data to back up its positive impacts and evidence-based recommendations. (Lam & Chien., 2016; Böge et al., 2020).

The present study is aiming to evaluate the effect of brief mindfulness-based intervention in enhancing emotional regulation and levels of mindfulness among patients with schizophrenic disorder. The results of this study show the percentage distribution of the patients studied according to their levels of mindfulness. It reveals that after the treatment, there was a significant enhancement in high levels of mindfulness. This conclusion might be explained by confounding variables such as the fact that patients investigated were schizophrenic usually affects the cognitive, affective, and behavioral status of the patients as well as a general feeling of anxiety and fear. This interpretation is supported by Kim, (2018) who illustrated that the schizophrenic disorder is a high socioeconomic load due to functional deterioration and chronic progression, to the point that it comprises 20% of all mental health-related direct costs and belongs to the top ten diseases with the highest disability rate. Schizophrenic patients are

vulnerable to stress due to difficulties in interpersonal relationships and low self-esteem (Kumar & Mohanty, 2016).

Similar to the forgoing current study results, a study in Los Angeles found that schizophrenic patients endorsed lower levels of overall mindfulness than control participants. Group differences were significant for the facets of describing, acting with awareness, and non-judging and the magnitudes of these effects were medium to large. Findings from this initial study suggest that schizophrenia patients may benefit from mindfulness-based interventions because they have lower self-reported mindfulness than controls and demonstrate strong relationships between mindfulness and psychological constructs related to adaptive functioning (Hodann-Caudevilla et al., 2020; Naomi et al., 2015).

The main objective of the present study was to investigate the percentage distribution of the difficulties in emotion regulation pre-and post-intervention among studied patients pre/post program. It indicates the improvement of patients' difficulties in emotion regulation. As the scores in the pre-program tend to increase compared to the post-program total score in the moderate level of patients' difficulties in emotion regulation in the immediate post-test. Nonetheless, the difficulties in emotion regulation were significantly higher in the pre-program levels among studied patients, a possible explanation for this finding may be that the mindfulness may work by helping the individual to better cope with difficult emotions and symptoms, such as sadness and fear and with the high levels of stress that the individual with psychosis often experiences daily. Mindfulness treatments do not aim to decrease the occurrence or severity of the symptoms of psychosis, but by helping to reduce the distress people experience, many of these treatments help indirectly to alleviate psychotic symptoms as well.

In line with the foregoing, recent studies have demonstrated that mindfulness-based

Programs are effective in reducing the stress response and improving the psychological well-being of various populations (Kim et al., 2021). Similar results were identified by van der Valk et al., (2013) have revealed that mindfulness-based interventions are effective in the treatment of various mental health disorders, and they may improve psychological symptoms and reduce stress in persons with a mental illness. Lam, & Ho (2020) illustrated that mindfulness-based interventions appeared to be effective in improving emotion regulation among schizophrenic patients.

Moreover, studies have shown that is effective at reducing cardiovascular disease, depression Wahbeh, & Nelson, 2019; Hofmann et al., 2010), anxiety, and stress (Shin, & Park, 2016). as well as improving mindfulness, positive affect, negative affect, emotion

regulation, wellbeing, reduced anxiety, sadness, and quality of life (Vignaud et al., 2019 & Shawyer et al., 2012). In addition, mindfulness-based interventions help schizophrenia patients with residual negative symptoms improve clinical symptoms including negative symptoms, general psychopathology symptoms, and cognitive impairment (Shen et al., 2021).

The findings also show that the best predictors of multivariate linear regression for factors affecting mindfulness among the studied patients, as remarked, the strong factor affecting mindfulness and difficulties in emotion regulation among the studied patients was education level, marital status, family income, and beginning of the disease. Followed by Job, the beginning of treatment, and last hospital admission. This result was in the same line as Shabankare et al., (2021) who stated that there was a direct and negative relationship observed between mindfulness and difficulties in emotion regulation with emotional divorce and sexual satisfaction. Furthermore, Serhatoglu et al., (2022): indicated that the findings suggest that, the relationship between mindfulness and ill-being may be more complex than previously thought. On the contrary, Naomi et al., (2015) reported that mindfulness showed essentially no demographic or clinical characteristics to support their hypothesis that greater mindfulness.

Finally, the current study proved a statistically significant negative correlation between patients' levels of mindfulness with difficulties in emotion regulation post-program. This is probably since gaining thought awareness, mindfulness lets us explore and identify all aspects of the external world, including our body. Simple mindful exercises such as breath control or sensory relaxation can calm the storm inside and guide our actions in the right way. These results are congruent with Peixoto & Gondim (2020) who asserted that the results of empirical studies suggest that mindfulness is associated with the use of adaptive emotional regulation strategies favoring healthy psychic functioning. The limits and contributions of this review are also pointed out. Cavicchioli et al., (2018) added that mindfulness appears to be a protective factor for difficulties with emotion regulation effects on alcohol use disorder.

## Conclusion

Based on the findings of the present study, it can be concluded that in the mindfulness program, there was a statistically significant negative correlation between patients' levels of mindfulness with difficulties in emotion regulation. A significant improvement between a high level of mindfulness in the pre-program and post-program phase.

## Recommendations

The study recommended the following:

- Developing a health education mindfulness-based intervention program for every institutionalized schizophrenic patient, with qualified and trained nurses.
- Mindfulness-based intervention program for psychiatric patients' care is recommended as a non-invasive, non-pharmacological, inexpensive, and cost-effective method without complications.
- Results lay the ground for future research to focus on the systematic study of mindfulness-based intervention in large samples, its treatment processes, outcomes, and effectiveness for in-patients with schizophrenic disorders.

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