

# Effect of Psycho-Educational Program on Psychological Distress and Post-Traumatic Stress Disorder among Stroke Survivors' Patients

Mona M. Barakat<sup>1</sup>, Hend A. Mostafa<sup>2</sup>

<sup>1</sup>Psychiatric and Mental Health Nursing. Faculty of Nursing. Benha University, Egypt.  
Email: Lovegana120@yahoo.com

<sup>2</sup>Psychiatric and Mental Health Nursing. Faculty of Nursing. Benha University, Egypt.  
Email: Logy\_sandy91@yahoo.com

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## ABSTRACT

**Context:** A stroke is a brain attack, and a major global health problem not merely affects a person physically but also emotionally. Psychosocial well-being is frequently threatened following a stroke. The improvement of the psychological status of stroke patients is essential to stroke management and recovery.

**Aim:** The study aimed to evaluate the effect of the psychoeducational program on psychological distress and posttraumatic stress disorder among stroke survivors' patients.

**Methods:** A quasi-experimental study design (one group pre/posttest) was utilized to achieve the aim of the study in the neurology department at Benha University Hospital at Benha City, Kaluobia Governorate. A convenient sample of 40 stroke survivor's patients was included in the study as a single study group. Three tools were utilized for data collection, structured interview questionnaire, Hospital Anxiety, and Depression Scale, and Post Traumatic Stress Disorder Scale.

**Results:** Reveals that there was a highly statistically significant reduction in the severity of total anxiety and depression and also total posttraumatic stress disorder post-program implementation than before. Also, there was a highly statistically significant positive correlation between total posttraumatic stress, total anxiety, and total depression among studied patients pre and post-program implementation at  $p$ -value  $<0.001$ .

**Conclusion:** Psycho-educational program had a positive effect on reducing psychological distress and posttraumatic stress disorder among stroke survivors' patients. The study recommended that psychological nursing intervention should be continuously integrated as a part of routine nursing care provided for stroke survivors' patients in the neurology and rehabilitation unit.

**Keywords:** Psycho-educational program, psychological distress, posttraumatic stress disorder, stroke survivors' patients

## 1. Introduction

A stroke is a medical emergency. It occurs due to a decrease or blockage in the brain's blood supply. Strokes can appear as hemorrhagic strokes, ischemic strokes, or transient ischemic attacks (Moawad, 2020). Stroke is a significant public health threat globally, despite advances in modern medicine, medications, and medical technology; stroke diseases impose a substantial mortality and morbidity risk to the individual with an increased economic burden to the society. Globally, stroke is the second leading cause of death after ischemic heart disease, with approximately 6.7 million stroke deaths in 2015 (Benjamin et al., 2018).

Stroke has the most significant destabilizing impact. The functional and psychological changes related to stroke, affect not only the patient but also the family. The psychological changes include emotional, behavioral, and cognitive alterations after stroke. Numerous studies have demonstrated that psychiatric symptoms are common after stroke. These studies suggest that the post-stroke population has a prevalence of depression, anxiety, and posttraumatic stress disorder (PTSD), occurring in approximately one-quarter to one-third of patients (Mahak et al., 2018). Stroke

severity, stroke-related disabilities, cerebral small vessel disease, previous psychiatric disease, poor coping strategies, and unfavorable psychosocial environment influence the presence and severity of the psychiatric sequel of stroke (Ferro et al., 2016).

Adverse psychological outcomes frequently occur after a stroke that affects not only stroke patients themselves but their family members and caregivers as well; as anxiety, which is common and disabling affecting around a quarter of stroke patients. It can hamper stroke rehabilitation efforts and prevent patients from returning to their usual activities (Chun et al., 2018).

Anxiety is one of the most common psychological disorders post-stroke estimated at 20%-47% and is associated with an increase in dependency in daily living activities and reduced social networking (Rizvi et al., 2018). It may present as generalized anxiety or stroke specific. For example, survivors often contend with changes in functional abilities and navigating life situations and have experienced a serious, life-threatening medical condition with a risk of recurrence, which may contribute to anxiety. Post-stroke anxiety is significantly associated with pre-stroke anxiety and post-stroke depression, as well as less disability (Terril et al., 2018).

Besides, depression is the most frequently seen

<sup>1</sup>Corresponding author: Mona M. Barakat

neuropsychiatric manifestation in stroke survivors' patients. Depression occurs in approximately 30% of people post-stroke (Wang et al., 2018). Depression, in many ways, resembles the grief/mourning that follows bereavement and often evokes feelings of low self-esteem, guilt, self-reproach, withdrawal from interpersonal contact, and somatic symptoms such as eating and sleeping disturbances. Usually, the onset of depression in patients might be determined by the interaction between personality factors and the severity of the negative physical, psychological, and social consequences of stroke (Ibeneme et al., 2016).

Furthermore, depression is a distressing event for post-stroke patients as it hampers their ability to undergo therapy and impairs their functional outcome. Depression is associated with more extended hospitalization, institutionalization, poorer functional outcome, and mortality, also increases the risk of suicide, therefore, increasing mortality. The etiology of post-stroke depression (PSD) is complex and reported to be multi-factorial in origin. It also depends on the size and location of the infarct. Also, family history or prior history of depressive disorders makes them prone to be affected with depression following a stroke (Dar et al., 2017).

A stroke is a traumatic physical and emotional event, and it may take time for a stroke survivor to adapt and cope with all the changes they are experiencing. Posttraumatic stress disorder is an anxiety disorder caused by exposure to a traumatic event. Symptoms of PTSD include nightmares, elevated heart rate and blood pressure, and avoidance of reminders of the traumatic event (Lazarony, 2015). Experiencing PTSD symptoms can represent a new problem for the patient after experiencing a stroke (Garton et al., 2017). One in four patients reports posttraumatic stress symptoms (PTSS) within a year of their stroke. Post-stroke PTSD can present longitudinal challenges to patients, occurs in about 25% of patients, and significantly impacts their lives and their families (Garton et al., 2017).

Given the complexity of stroke survivors' patients' conditions, it is of primary importance to provide holistic support by addressing psychological and emotional conditions. However, previous evidence showed mixed effects of psychoeducational interventions on the psychosocial aspects of patients. In the previous study by Kneebone & Jeffries (2015), they mentioned that psychoeducational intervention program was an effective tool in improving psychological status among stroke survivors' patients by ensuring psychological support is considered by the multidisciplinary team (MDT) to be as critical to recovery from stroke as physical rehabilitation.

The nurse in the multidisciplinary team has traditionally been described as a natural and significant member of the rehabilitation team. Nurses are the health professionals most in contact with stroke survivors and their families during an acute episode and are the key to assessing clinical depression and anxiety (Mitchell, 2015). Nurses are well-positioned to recognize a stroke, educate patient caregivers, and aid patients with post-stroke psychological distress in their efforts to achieve physical,

cognitive, and emotional recovery (Hamid & MacKenzie, 2017).

## 2. Significance of the study

Stroke is one of the leading causes of disability among affected people all over the world. According to the latest WHO data published in 2017, stroke deaths in Egypt reached 56,710 or 11.04% of total deaths. The age-adjusted death rate is 95.56 per 100,000 of population ranks Egypt the 74 in the world (World Health Organization, WHO, 2017). The incidence and prevalence of stroke in Egypt are high. In Egypt, according to recent estimates, the overall prevalence rate of stroke is high, with a crude prevalence rate of 963/100 000 inhabitants (Abd-Allah et al., 2017; Abd-Allah & Moustafa, 2014).

By the neurological impairment following a stroke, survivors may experience various negative consequences. Previous studies found that approximately 40% of stroke patients experience functional disability, and nearly one-third of them suffer from psychological distress, including depression and anxiety in the first-year post-stroke (Huang et al., 2014). Pharmacological treatment may be effective in treating post-stroke depression and anxiety, but not in preventing it. Furthermore, antidepressants may have adverse effects on persons with stroke and should be used with care (Juth et al., 2018).

Consequently, there is a need for developing alternative interventions. So far, psychoeducational interventions have had effects on stroke survivors' patients. The researcher view that this topic is essential because in Egypt, due to the paucity of rehabilitative services, stroke survivor patients may exhibit disabilities, and his psychological status is affected due to the nature of the disease. So, the psychoeducational program is designed to enable stroke survivor patients to compensate for or eliminate their psychological distress like depression, anxiety, and PTSD created by this illness.

## 3. Aim of the study

This study aimed to evaluate the effect of the psychoeducational program on psychological distress and posttraumatic stress disorder among stroke survivors' patients. This aim will be achieved through,

- Assessing levels of psychological distress and posttraumatic stress disorder among stroke survivors' patients,
- Developing and implementing a psychoeducational program for stroke survivors' patients.
- Evaluating its effect on psychological distress and posttraumatic stress disorder among the studied patients.

### 3.1. Research hypotheses

- H1: Post-stroke survivor patients who exposed to the psychoeducational program will exhibit reduced psychological distress (anxiety and depression) compared with their pre-intervention level.
- H2: Post-stroke survivor patients who exposed to the psychoeducational program will exhibit improved

posttraumatic distress compared with their preintervention level.

### 3.2. Operational definitions

#### *Psychological distress.*

Psychological distress is defined in this study as anxiety and depression experienced by the post-stroke survivors' patient.

#### *Posttraumatic stress disorder.*

Posttraumatic stress disorder is operationally defined in this study as intrusive re-experiencing, avoidance and numbness, and hyperarousal state experienced by the post-stroke survivors' patient.

## 4. Subjects and Methods

### 4.1. Research design

A quasi-experimental study design (single-group pre/posttest) was utilized to achieve this study's aim. Quasi-experimental research is comparable to experimental research that an independent variable is manipulated. It is distinct from experimental research because there is no control group, no random selection, no random assignment, or no active manipulation (*LoBiondo-wood & Haber, 2017*)

### 4.2. Research setting

The study was conducted in the neurology department at Benha University Hospital at Benha City, Kaluobia Governorate. This department consists of 3 rooms with a capacity of 26 beds, which provide care for neurological and acute psychiatric illnesses who need institutional care.

### 4.3. Subjects

A convenient sample 40 stroke survivor's patients who are treated at the settings mentioned above and fulfill the following inclusion criteria: Age 20 years or older, both sexes (male and female), are willing to participate in the study, free from severe cognitive, physical and communication impairment as well as neurological or psychiatric disorders. Besides, they did not receive any psychoeducational stroke program before.

### 4.4. Tools of the study

Three tools were used to collect the data of this study.

#### 4.4. 1. Structured Interview Questionnaire

It designed by the researcher to assess the patient's socio-demographic characteristics and clinical data. It composed of two parts. Part 1 concerned with socio-demographic characteristics of patients, including age, gender, marital status, educational level, occupation, residence, residence, cohabitation, and income. Part 2 encompassed patients' clinical data related to causes of stroke, types of stroke, disease duration (months), having a previous stroke, having a previous hospitalization, and a family history of stroke.

#### 4.4. 2. Hospital Anxiety and Depression Scale (HADS)

This scale was developed by *Zigmond and Snaith (1983)*, to measure anxiety and depression. This scale consisted of 14 items, seven items for measuring anxiety such as "I feel tense or 'wound up'" and the other seven items for measuring depression, such as "I still enjoy the things I used to enjoy." Each question has four responses, each response with a score of 0 (not at all), to 3 (very often) for questions (1-2-3-6-7-10-11-12) with reverse questions (4-5-8-9-13-14). Higher scores are indicating the greater frequency of symptoms.

#### *Scoring system:*

The scores ranged from 0 to 21 for each subscale. An analysis of scores on the two subscales supported the differentiation of each mood state into four levels; normal (0-7), mild (8-10), moderate (11-14), and severe (15-21).

#### 4.4.3. Post-Traumatic Stress Disorder Scale (PTSD)

The posttraumatic stress disorder scale was developed by *Davidson et al. (1997)* to measure symptoms of PTSD. This scale was consisting of 17 questions. They indicate the degree to which they have been bothered by that particular symptom over the past month. Each of the items describes the symptom in terms of severity or frequency, creating the subscales of intrusive re-experiencing (items 1,2,3,4,5), avoidance, and numbness (items 6,7,8,9,10,11,12), and hyperarousal (items 13,14,15,16,17). Items responses range from 1 (not at all), 2 (A little bit), 3 (Moderately), 4 (Quite a bit), and 5 (extremely).

#### *Scoring system:*

Total scores were ranging from 17–85.

- Low = < 43 score
- Moderate= 43-<64 score
- High= ≥ 64 score

### 4.5. Procedures

The content validity of tools was carried out by a jury of five experts of psychiatric mental health nursing and psychiatric medicine to ascertain their face and content validity. Modification carried out according to the panel's judgment on the clarity of sentences and appropriateness of the content. Testing reliability of proposed tools was done statistically by alpha Cronbach test, for hospital anxiety and depression scale was (0.89) and (0.92) for posttraumatic stress disorder scale that indicates a high reliability of the used tools.

A pilot study conducted on 10% (4 patients) of the total sample of patients, and they were excluded from the study sample. To determine the time required to complete data collection, test the feasibility of the study process and clarity of tools.

This study was conducted after primary approval from the Ethics Committee, Faculty of Nursing, Benha University. Then official permission was obtained from the head of the Neurology Department at Benha University Hospital. An explanation for the purpose of the study was

given to participants, and they were also informed that they could withdraw from the study before the completion of the study. After agreement for participation in the study, they were asked to sign a consent form. Moreover, participants reassured that all information gathered would be confidential and used only for the study.

**Field of work:** Once official permission to carry out the study was obtained from relevant authorities after explaining its purpose. The interview was conducted individually for patients eligible for the study (fulfilled the inclusion criteria) to explain the purpose of the study, ensure confidentiality, and obtain informed written consent. The study was carried out for (8 months) from the beginning of January 2019 to the end of August 2019. It went through the following phase:

The pre-intervention phase took about two months from the beginning of January 2019 to the end of February 2019. Teaching materials were prepared, and the training strategy was developed based on the detected needs. As well, the schedule, teaching sessions, media included, and the handout were prepared.

The intervention phase was carried out from the beginning of March 2019 to the end of August 2019. Patients were interviewed in groups before applying for the psychoeducational program in order to collect the baseline patients' data using all study tools (Structured Interview Questionnaire Sheet, HADS, and Posttraumatic Stress Scale).

This interview took about 35 to 40 minutes to fill in the tools. Patients were recruited (40 patients), selecting the patient according to the criteria. This pre-study test was designed to allow the researchers to collect a baseline assessment of the stroke patient's psychological distress and PTSD symptoms in order to compare it with the immediate post-program. The data collected (pre-test) three days/week in the morning and afternoon.

After the questionnaires were completed, the training program was implemented by the researchers. This program was conducted through 8 sessions involving theoretical and practical content. The first session involved the introduction about the aim, objectives, and content of the sessions, and fill pre-test. The second session involved an overview of stroke, diagnosis, causes, complications, treatment, and prevention.

The third and fourth sessions involved an overview of psychological distress, such as "anxiety and depression following a stroke," and posttraumatic stress following a stroke. The fifth and sixth sessions involved stress management techniques. The seventh session involved positive thinking and how to change negative thoughts, while the eighth session involved a summary about the program sessions and took the post-assessment test. The researcher scheduled the teaching sessions, and patients were divided into small groups according to the number of hospitalized patients in the same room. The duration of each session was about 45-60 minutes, three days/week.

**Psychoeducational program:** The researcher developed it from literature reviews (Saulsman, 2017), researchers' experience, and opinions of the medical and nursing

experts, and based on the patient's assessment needs to decrease psychological distress and posttraumatic stress for patients. The teaching booklet was revised, validated, and modified based on the experts' comments. It was written in Arabic using simple language with illustrations. This program has a general objective and specific objectives. The general objective to enable stroke survivor patients to relieve their psychological distress like depression, anxiety, and PTSD created by this illness. Specific objectives were matched the sessions' content. The psychoeducational program was achieved by using several teaching methods such as brainstorming, lecture, discussion, providing the example. Data show videos, role play, and pictures as media were also used.

At the end of each session summary, feedback, and further clarifications were done for vague items. The program booklet was concerning:

- Stroke (definition, risk factors, types, causes, early and late symptoms, diagnosis, complications, treatment, as well as preventive measures).
- Psychological distress as anxiety following stroke (definition, signs and symptoms, causes, treatment, and prevention).
- Psychological distress as depression following stroke (definition, signs and symptoms, causes, treatment, and prevention).
- Posttraumatic stress following stroke (definition, signs and symptoms, causes, treatment, and prevention).
- Stress management techniques (relaxation exercises as deep breathing exercises, muscle relaxation technique, positive thinking, praying, exercises, reading a book, and visualization).
- Positive thinking and how to change negative thoughts into positive thoughts.

The post-intervention phase (Evaluation phase); immediately after implementation of the psychoeducational program for the patients, the researcher using the study tools, HADS and posttraumatic stress scale which was used before the program implementation to evaluate the impact of the psychoeducational program on psychological distress and posttraumatic stress among stroke survivor's patients. The post-program assessment started from the beginning to the end of August 2019, "lasted for one month."

#### **4.6. Data Analysis**

The collected data were tabulated and statistically analyzed using an IBM computer and the statistical package for social science (SPSS) advanced statistics, version 20 (SPSS Inc., Chicago, IL). Numerical data expressed as mean and standard deviation. Qualitative data were expressed as frequency and percentage. Relations between different variables were tested using the Friedman test, t-student. Pearson's correlation analysis was used to show the strength and direction of the association between two quantitative variables. A p-value < 0.05 was considered significant, and <0.001 was considered highly significant.

## 5. Results

Table 1 shows the socio-demographic characteristics of studied patients. It explains that 62.5% were in the age group of 40 to <50 years with mean age  $42.15 \pm 7.23$ , and also the table illustrates that 75.0% of the studied patients were males and (72.5%) were married. Concerning their educational level and occupation (42.5% & 47.5%) have secondary education and were employed. Regarding residence, 55.0% were from urban areas. This table also shows that 62.5% of studied patients were mentioned they do not have enough income. Regarding cohabitation, 82.5% were lived with their families.

Table 2 demonstrates the distribution of studied patients regarding their clinical data. 32.5% of the patient-reported the stroke is due to hypertension. About the type of stroke, 55.0% have an ischemic stroke, and 82.5% have a stroke for one month. Concerning having the previous stroke, 80.0% of studied patients did not have a previous stroke, and 85.0% have a negative family history of stroke.

Table 3 clarifies a comparison of studied patients according to total scores of anxiety pre and post-program. The result shows that there was a highly statistically significant improvement in all items of anxiety post-program implementation compared to before program implementation at  $p$ -value  $<0.001$ .

Table 4 shows a comparison of studied patients according to total scores of depression pre and post-program. Results report that there was a highly statistically significant improvement in all items of depression post-program implementation compared to before program implementation at  $p$ -value  $<0.001$ .

Table 5 illustrates the comparison between total anxiety and total depression level among studied patients pre and post-program implementation. The result shows a decrease in the severity of the total level of anxiety and depression from 62.5% to 12.5% post-program implementation than before program implementation at  $p$ -value  $<0.001$ .

Table 6 represents the comparison between posttraumatic stress subscales scores for the studied patient's pre and post-program implementation. The result shows a highly statistically significant improvement in the mean scores of all posttraumatic stress subscales of the studied patients' post-program implementation compared to before program implementation at  $p$ -value  $<0.001$ .

Figure 1 demonstrates the comparison between total posttraumatic stress levels among studied patients pre and post-program implementation. The result reveals a reduction of the severity of total posttraumatic stress from 48.4% to 19.1% post-program implementation than before program implementation.

Table 7 shows the relationship between socio-demographic characteristics and total posttraumatic stress levels among studied patients pre and post-program implementation. It reports a non-statistically significant relationship found between socio-demographic characteristics and total posttraumatic stress levels except with age, gender (pre), age, and cohabitation (post).

Table 8 illustrates the relationship between clinical data and total posttraumatic stress levels among studied patients pre and post-program implementation. It clarifies a non-statistically significant relationship between clinical data and total posttraumatic stress levels except with the causes of stroke (post-program).

Table 9 shows the correlation between mean scores of total posttraumatic stress, total anxiety, and total depression among studied patients pre and post-program implementation. There is a significant relationship between total depression and total posttraumatic stress preprogram at  $p <0.05$  and a highly statistically significant positive correlation between total depression and total anxiety before the program at  $p 0.000$ . The post-program relationship reveals a highly statistically significant positive relationship between total depression and total anxiety at  $p 0.000$ .

**Table (1): Frequency and percentage distribution of studied patients according to their socio-demographic characteristics (n=40).**

Socio-demographic characteristics	Studied patients (n=40).	
	N	%
<b>Age/year</b>		
20- < 30 years	5	12.5
30- < 40 years	10	25.0
40 - < 50 years	25	62.5
Mean ± SD		42.15±7.23
<b>Gender</b>		
Male	30	75.0
Female	10	25.0
<b>Marital Status</b>		
Single	2	5.0
Married	29	72.5
Divorced	1	2.5
Widow	8	20.0
<b>Educational level</b>		
Read and write	7	17.5
Basic learning	6	15.0
Secondary learning	17	42.5
University learning	8	20.0
Postgraduate	2	5.0
<b>Occupation</b>		
Employment	19	47.5
Free work	15	37.5
Unemployment	6	15.0
<b>Residence</b>		
Urban	22	55.0
Rural	18	45.0
<b>Income</b>		
Not enough	25	62.5
Enough	12	30.0
Enough and save	3	7.5
<b>Cohabitation</b>		
Alone	2	5.0
With family	33	82.5
With relatives	5	12.5

**Table (2): Frequency and percentage distribution of studied patients regarding their clinical data (n=40).**

Clinical data	Studied patients (n=40)	
	No	%
<b>Causes of stroke</b>		
Hypertension	13	32.5
Heart disease	12	30.0
Bleeding	9	22.5
Diabetics	6	15.0
<b>Types of stroke</b>		
Hemorrhagic	18	45.0
Ischemic	22	55.0
<b>Disease duration (months)</b>		
One month	33	82.5
Two or more months	7	17.5
<b>Having the previous stroke</b>		
None	32	80.0
One	6	15.0
Two or more	2	5.0
<b>Having previous hospitalization (n=8)</b>		
One time	6	75.0
Two or more	2	25.0
<b>Family history of stroke</b>		
Yes	6	15.0
No	34	85.0

**Table (3): Comparison of studied patient anxiety pre and post-program implementation (n=40).**

Anxiety Subscale	Pre-program		Post-program		X <sup>2</sup>	p-value
	No	%	No	%		
<b>I feel tense or 'wound up.'</b>						
Not at all	0	0.0	25	62.5	43.3	0.000
From time to time, occasionally	5	12.5	0	0.0		
A lot of the time	10	25.0	10	25.0		
Most of the time	25	62.5	5	12.5		
<b>Get a sort of frightened feeling as if something awful is about to happen</b>						
Not at all	0	0.0	0	0.0	25.8	0.000
A little, but it does not worry me	15	37.5	25	62.5		
Yes, but not too badly	0	0.0	10	25.0		
Very definitely and quite badly	25	62.5	5	12.5		
<b>Worrying thoughts go through my mind.</b>						
A lot of the time	15	37.5	10	25.0	39.3	0.000
A great deal of the time	25	62.5	5	12.5		
From time to time	0	0.0	0	0.0		
Only occasionally	0	0.0	25	62.5		
<b>I can sit at ease and feel relaxed.</b>						
Definitely	0	0.0	25	62.5	43.3	0.000
Usually	5	12.5	0	0.0		
Not Often	10	25.0	10	25.0		
Not at all	25	62.5	5	12.5		
<b>I get a sort of frightened feeling like 'butterflies' in the stomach.</b>						
Not at all	0	0.0	25	62.5	63.3	0.000
Occasionally	15	37.5	0	0.0		
Quite Often	0	0.0	10	25.0		
Very Often	25	62.5	5	12.5		
<b>I feel restless as I have to be on the move.</b>						
Very much indeed	25	62.5	5	12.5	25.8	0.000
Quite a lot	0	0.0	10	25.0		
Not very much	15	37.5	25	62.5		
Not at all	0	0.0	0	0.0		
<b>I get sudden feelings of panic.</b>						
Very often indeed	25	62.5	5	12.5	46.6	0.000
Quite often	0	0.0	10	25.0		
Not very often	10	25.0	0	0.0		
Not at all	5	12.5	25	62.5		

**Table (4): Comparison of studied patient depression pre and post-program implementation (n=40).**

Depression scale	Pre-program		Post-program		X <sup>2</sup>	p-value
	No	%	No	%		
<b>I still enjoy the things I used to enjoy</b>						
Definitely as much	0	0.0	0	0.0	39.3	0.000
Not quite so much	0	0.0	25	62.5		
Only a little	15	37.5	10	25.0		
Hardly at all	25	62.5	5	12.5		
<b>I can laugh and see the funny side of things:</b>						
As much as I always could	0	0.0	25	62.5	43.3	0.000
Not quite so much now	5	12.5	0	0.0		
Definitely not so much now	10	25.0	10	25.0		
Not at all	25	62.5	5	12.5		
<b>I feel cheerful</b>						
Not at all	0	0.0	5	12.5	25.8	0.000
Not often	0	0.0	10	25.0		
Sometimes	15	37.5	25	62.5		
Most of the time	25	62.5	0	0.0		
<b>I feel as if I am slowed down.</b>						
Nearly all the time	25	62.5	5	12.5	25.8	0.000
Very often	0	0.0	10	25.0		
Sometimes	15	37.5	25	62.5		
Not at all	0	0.0	0	0.0		
<b>I have lost interest in my appearance.</b>						
Definitely	25	62.5	5	12.5	43.3	0.000
I do not take as much care as I should	10	25.0	10	25.0		
I may not take quite as much care	5	12.5	0	0.0		
I take just as much care as ever	0	0.0	25	62.5		
<b>I look forward with enjoyment to things.</b>						
As much as I ever did	0	0.0	25	62.5	43.3	0.000
Rather less than I used to	5	12.5	0	0.0		
Definitely less than I used to	10	25.0	10	25.0		
Hardly at all	25	62.5	5	12.5		
<b>I can enjoy a good book or radio or TV program</b>						
Often	0	0.0	0	0.0	26.6	0.000
Sometimes	5	12.5	25	62.5		
Not often	10	25.0	10	25.0		
Very seldom	25	62.5	5	12.5		

**Table (5): Comparison between total anxiety and depression levels among studied patients pre and post-program implementation (n=40).**

Level	Total depression				X <sup>2</sup>	P-value	Total anxiety				X <sup>2</sup>	P-value
	Pre-program		Post-program				Pre-program		Post-program			
	No	%	No	%			No	%	No	%		
Normal	0	0.0	11	27.5	26.8	0.000	1	2.5	7	17.5	30.4	0.000
Mild	7	17.5	14	35.0			9	22.5	18	45.0		
Moderate	8	20.0	10	25.0			5	12.5	10	25.0		
Severe	25	62.5	5	12.5			25	62.5	5	12.5		

**Table (6): Comparison of posttraumatic stress scores of the studied patient pre and post-program implementation (n= 40).**

Posttraumatic Stress subscales	Pre-program Mean±SD	Post-program Mean±SD	T-test	P-value
Total intrusive re-experiencing subscale	17.25±3.88	10.50±4.45	6.502	0.000
Total avoidance and numbness subscale	22.22±4.99	15.85±6.09	4.590	0.000
Total hyper-arousal subscale	18.15±4.08	9.60±5.12	7.518	0.000



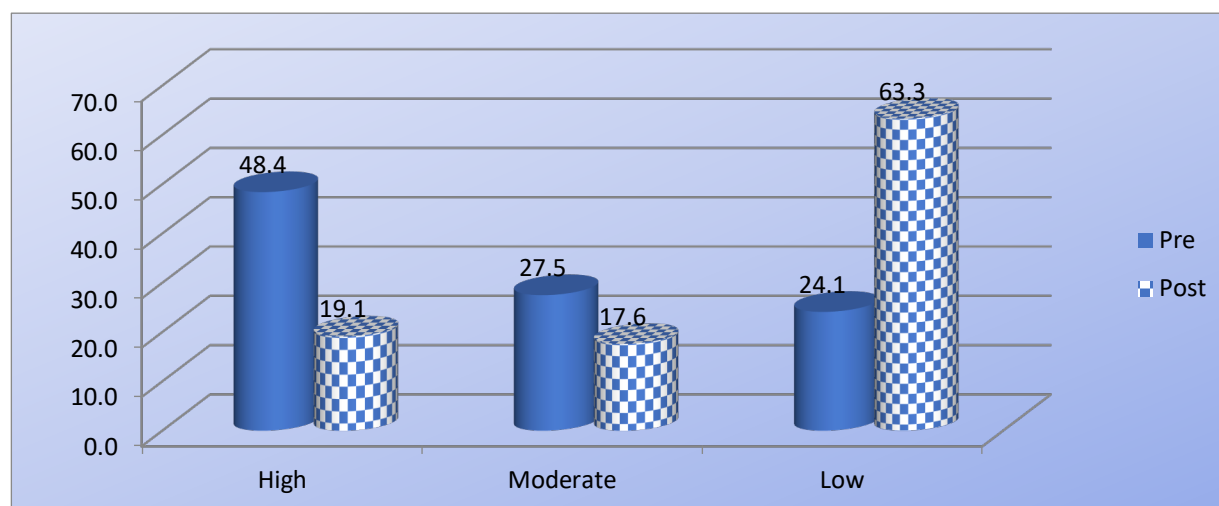


Figure (1): Comparison between total posttraumatic stress level among studied patients pre and post-program implementation (n=40).

Table (7): Relationship between socio-demographic characteristics and total posttraumatic stress level among studied patients pre and post-program implementation (n=40).

Socio-demographic items	Posttraumatic stress		F1/t1*	P-value	F2/t2*	P-value
	Pre-program Mean±SD	Post-program Mean±SD				
<b>Age</b>						
20- less than 30Y	69.00±4.00	35.80±22.10				
30- less than 40Y	57.70±3.05	21.80±2.48	4.14	0.001	3.25	<0.05
40- less than 50Y	55.32±13.17	41.64±11.99				
<b>Gender</b>						
Male	55.10±11.88	34.66±14.02	2.29	<0.05	1.75	0.08
Female	65.20±5.05	39.80±16.25				
<b>Marital status</b>						
Single	63.50±9.19	39.50±28.99				
Married	58.55±8.63	33.89±12.72	2.70	>0.05	0.44	>0.05
Divorced	30.00±28.99	58.00±15.03				
Widow	56.25±17.09	39.75±17.54				
<b>Educational level</b>						
Read and write	61.57±15.30	40.28±18.81				
Basic learning	59.33±1.75	36.33±11.92	1.202	> 0.05	0.780	> 0.05
Secondary learning	59.23±8.44	32.47±13.31				
University learning	48.62±15.38	38.37±15.03				
Postgraduate	61.00±5.65	39.50±24.74				
<b>Occupation</b>						
Employment	55.94±11.52	35.47±13.17				
Free work	55.86±11.65	35.26±15.56	2.613	> 0.05	0.894	> 0.05
Unemployment	67.33±5.20	39.16±18.36				
<b>Residence</b>						
Urban	57.90±11.94	36.45±15.38	0.15	> 0.05	0.49	> 0.05
Rural	57.27±11.08	35.33±13.92				
<b>Income</b>						
Not enough	58.92±10.23	33.80±13.65				
Enough	56.66±12.45	38.00±15.11	0.450	> 0.05	0.731	> 0.05
Enough and save	50.66±18.33	45.66±20.50				
<b>Cohabitation</b>						
Alone	58.00±1.41	31.50±0.70				
With family	57.84±11.46	34.27±14.79	1.089	> 0.05	3.242	<0.05
With relatives	56.00±14.74	48.80±8.78				

\* F1 /t1 between socio-demographic and pre-program F2 /t2 between socio-demographic and post-program.

**Table (8): Relationship between clinical data and total posttraumatic stress among studied patients pre and post-program implementation (n=40).**

Clinical data	Total posttraumatic stress		F1/t1	p-value	F2/t2	p-value
	Pre-program	Post-program				
	Mean±SD	Mean±SD				
<b>Causes of Stroke</b>						
Hypertension	61.87±5.79	22.00±2.61				
Heart disease	38.57±13.97	44.14±17.63	1.135	> 0.05	4.147	<0.05*
Bleeding	62.55±2.87	41.22±10.92				
Diabetics	62.00±5.89	39.50±10.09				
<b>Types of Stroke</b>						
Bleeding	54.38±14.05	37.22±15.27	1.52	> 0.05	0.49	> 0.05
Ischemic	60.27±8.14	34.90±14.23				
<b>Disease Duration (Months)</b>						
One month	58.66±10.30	34.00±14.15	0.59	> 0.05	1.66	> 0.05
Two or more months	52.71±15.76	45.14±13.80				
<b>Having a previous stroke</b>						
None	57.12±12.54	37.06±15.67				
One	59.83±5.91	29.83±8.81	1.257	> 0.05	2.100	> 0.05
Two or more	59.00±0.00	36.50±2.12				
<b>Having a previous hospitalization</b>						
None	58.03±11.52	36.46±15.21				
One time	55.00±13.59	33.00±14.40	0.807	> 0.05	1.894	> 0.05
Two or more	59.00±0.00	36.50±2.12				
<b>Family history of stroke</b>						
Yes	61.66±3.44	30.83±9.80	1.61	> 0.05	0.68	> 0.05
No	56.91±12.20	36.85±15.18				

Note: F1 /t1 between socio-demographic and preprogram F2 /t2 between socio-demographic and postprogram

**Table (9): Correlation between total posttraumatic stress, anxiety, and depression among studied patients pre and post-program implementation (n= 40).**

Variables	Pre-program				Post-program			
	Total posttraumatic stress		Total anxiety		Total posttraumatic stress		Total anxiety	
	r	P-value	r	P-value	r	P-value	r	P-value
<b>Total posttraumatic stress</b>	-		0.304	0.057	-		0.206	0.203
<b>Total anxiety</b>	0.304	0.057	-		0.206	0.203	-	
<b>Total depression</b>	0.322	0.043	0.997	0.000	0.196	0.225	0.999	0.000

\*\* Highly statistically significant

## 6. Discussion

Stroke is the third most common cause of death after heart disease and all cancers. Besides, stroke is one of the leading causes of disability among affected people all over the world. Generally, the stroke should be considered as an adverse life event, which has many psychological changes among stroke patients' survivors, such as depression, anxiety, and posttraumatic stress disorders, which may result in high morbidity and mortality rates, poorer treatment outcomes and increased length of stay in hospital. Therefore, it is crucial to support stroke survivor patients psychologically and give the education to help them to overcome their distress post-stroke and hence improve their quality of life (Kirkevold et al., 2018). The present study aimed to evaluate the effect of the psychoeducational program on psychological distress and posttraumatic stress disorder among stroke survivors' patients

The present study revealed that the highest percentage of the studied patients' ages were between 40 to less than 50 years old. It might be due to stroke incidence rises exponentially with increasing age. These findings were in

agreement with Islam et al. (2015), who assessed the prevalence and associated factors of depression among post-stroke patients in Bangladesh and found that majority of their study subjects were above 40 years of age. Regarding gender, the present study showed that three-quarters of studied patients were males. This finding may be due to that strokes more prevalent in men more than women. This finding was consistent with Mohammad et al. (2011), who showed that the frequency of stroke is 30% higher in men than women among his studied sample. On the contrary, these findings were in disagreement with Olsen and Andersen (2010), who stated that increased incidence of stroke in females as compared to males.

In this study, the results showed that the majority of the studied patients were married. These findings were in agreement with Feroo et al. (2016), who found that the majority of the patients were married. On the contrary, these findings were in disagreement with Rees et al. (2010), who stated that most of the patients were divorced.

Concerning the education level, less than half of the studied patients had a secondary level of education. This finding could be due to the majority of studied patients who did not have enough income to complete their education,

which is already reported in the current study that about two-thirds of the studied patients reported they did not have enough income. On the contrary, these findings were in disagreement with *Siddiqui et al. (2013)*, who stated that the highest percentage of the patients had primary education.

The result of the current study revealed that less than half of the studied patients were employed. This result could be explained as many studied patients need a job to cover the cost of their treatment and follow up after discharge from the hospital. These findings were contradicted with *Hakim et al. (2012)*, who found that the highest percentage of the patients were unemployed.

As regard residence, the result of the present study showed that more than half of the studied patients were from the urban area. This finding might be due to life in urban had many financial necessities, which might cause psychological stress added to the patient financial burden. These findings were in disagreement with *Summers et al. (2012)*, who found that the majority of the patients were from rural areas.

In this study, the results demonstrated that more than half of the studied patients did not have sufficient income. This finding could be due to the cost of treatment, and follow up is expensive. Besides, the majority of the studied sample was married and had financial responsibilities toward their families. These findings were similar to the study done by *Alberts et al. (2010)*, who found that more than half of the patients' economic status was not enough.

As regard to cohabitation, the majority of studied patients lived with their families. This finding could be explained as the majority of studied patients were married and hence lived with their families. Also, there is a family bond in the traditions and cultures of Egyptian families, even after marriage. These findings were in disagreement with *Aron et al. (2016)*, who found in their study that the highest percentage of the studied subjects were lived alone.

Concerning to type of stroke, more than half of studied patients had an ischemic stroke. This finding could be justified by the spread of this type of stroke among these age groups more than older age patients as the highest percentage of the studied patients were between 40 to less than 50 years old. These findings were following *Ferro et al. (2016)*, who found that about two-thirds of his studied sample had an ischemic stroke. These findings were matched with *Khan and Vohra (2010)*, who reported the spread of ischemic stroke among the majority of his studied sample.

The study results also showed that, regarding the duration of illness, most of the studied patients were having a stroke from one month ago. These findings were in disagreement with *Towfighi et al. (2017)*, who found in their study that the highest percentage of the studied subjects regarding the duration of illness was one year. On the same line, these findings were contradicted with *Pinto et al. (2011)*, who found that most of the patients regarding the duration of illness were two years ago.

Concerning having a previous stroke and prior admission to the hospital, the majority of the studied

patients mentioned that they did not have any stroke and did not admit to the hospital before. This finding might be due to the short duration of illness among the majority of the studied sample. These findings were contradicted with *Ayerbe et al. (2014)*, who found that the majority of the patients' re-hospitalization rate was three times.

Regarding the family history of stroke, the majority of studied patients had no family history of stroke. This finding could be justified by stroke more precipitated by environmental, psychological, emotional, and physical diseases than genetic transmission factors. These findings were similar to the study by *Choi et al. (2012)*, who stated that most of the studied subjects had no family history of stroke.

Regarding total anxiety and depression level among studied patients' pre and post-program implementation, the current study results indicated a decrease in the severity of the total level of anxiety and depression post-program implementation compared to before it. This finding indicates the effectiveness of the psychoeducational program content and its sessions application. It matched the need and interests of the studied patients. They provided knowledge that helps them change their perception from the cynical view that stroke is a terminal disease to a positive view of stroke, for example, many other chronic diseases that had possible treatment with appropriate follow-up. These results increase patients' hope in their lives and encourage them to perform their daily activities freely, hence decreasing the level of psychological distress.

These results were similar to *Gao et al. (2016)*, who stated that the psychoeducation program had proved to be a highly effective therapeutic method to reduce psychological problems among their studied sample. In the same line with *Visser et al. (2016)*, who added that the psychoeducation program had proved to be a highly effective therapeutic method to reduce anxiety and depression among stroke survivors' patients. These findings are supporting the first study hypothesis.

Concerning to total posttraumatic stress level among studied patients pre and post-program implementation, the current study results revealed that there is a decrease in the severity of the total level of posttraumatic stress post-program implementation than before. This finding could be due to during sessions of the psychoeducational program; the studied patients were instructed to participate in demonstration and re-demonstration of different coping methods with stress such as deep breathing exercises, muscle relaxation technique, positive thinking, praying, and exercises.

These results went parallel with the study done by *Robinson and Jorge (2015)*, who stated that posttraumatic stress disorder is widespread among stroke survivors' patients, and there was a significant reduction in the severity of it after applying for a psychoeducational program. These results were also in the same line with studies done by *Chun et al., 2018; Sagen et al. (2015)*, who found that the decreasing level of posttraumatic stress was the essential gain resulting from participation in the

sessions of the psychoeducational program. These findings are supporting the second study hypothesis.

The findings of the current study highlighted that there is no statistically significant relationship between socio-demographic characteristics and total posttraumatic stress levels among studied patients pre and post-program implementation except with age, gender, and cohabitation. This finding might be due to male patients aged between 40-50 years and who lived in urban areas were occupied with their illness because stroke is considered a life-threatening illness with fatal or even disabling complications. The illness has a high mortality rate, so patients feel more stressed about the cost of treatment, how to cope with the disease, and how to perform usual life activities. Hence, they had a worry about losing their job and also lost their financial responsibilities toward their families living in urban areas that require many financial necessities to meet demands of life, so they become depressed, stressed, and drawn from the society. These results were contradicting with *Garton et al. (2017)*, who stated that there was no significant relationship between patients' total posttraumatic stress and all variables of socio-demographic characteristics.

Concerning the relationship between clinical data and total posttraumatic stress level among studied patient's pre and post-program implementation, the present study results clarified that there is no statistically significant relationship found between clinical data and total posttraumatic stress level except with causes of stroke. This finding could be due to lives filled with many psychological stressors that considered the main precipitating factor of stroke and hence increasing posttraumatic stress level once stroke occurs regarding the management of illness, follow up and how to perform activities of daily living. However, these results inconsistent with studies done by *Mikami et al. (2014)*; *Siddiqui et al. (2013)*, who mentioned that there was no significant relationship between patients' total posttraumatic stress, causes and types of stroke, disease duration, having a previous stroke, and family history of stroke.

As for the correlation between mean scores of total posttraumatic stress, total anxiety and total depression among studied patients pre and post-program implementation, the results explained that there is a significant relationship between total depression and total posttraumatic stress preprogram at  $p < 0.05$ , and a highly statistically significant positive correlation between total depression and total anxiety before the program at  $p 0.000$ . Concerning to post-program, the relationship reveals a highly statistically significant positive correlation between total depression and total anxiety at  $p 0.000$ . This finding means when stress increase, anxiety and depression also increase.

This finding could be justified by stroke is a chronic illness that had many adverse psychological complications. It included chronic anxiety, depression, and posttraumatic stress, which negatively affected patients' lives as preventing them from enjoying their healthy life, performing daily activities, and maintaining self-confidence because it is not only the health, but financial, social, and

family life of the patients are adversely affected. This finding was supported by *Stein et al. (2018)*, who found a significant positive correlation between stress, anxiety, and depression among their studied patients.

## 7. Conclusion

Post-stroke survivor patients who exposed to the psychoeducational program have exhibited a reduction in psychological distress (anxiety and depression) and improving posttraumatic distress compared with their pre-intervention level.

## 8. Recommendations

Psychological nursing intervention should be continuously integrated as a part of routine nursing care provided for stroke survivors' patients in the neurology and rehabilitation unit.

Stress management and assertiveness training programs should be given to stroke survivors' patients to relieve their psychological distress and enhance their coping patterns.

Future research should be done with a larger sample size in several hospitals and in a broader geographical area to generalize the results.

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