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The Effect of Benson's Relaxation Technique on Depression, Anxiety, and Stress in Post Stroke Patients

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ABSTRACT

BACKGROUND: Stroke continues to be a serious medical issue. Most stroke survivors report experiencing emotional and behavioral changes after their stroke. Individuals who have reduced motor function usually go through a lot of Depression, Anxiety, and Stress as a result of pain, loss of control over their motor abilities, difficulty performing functional tasks that they used to do with easily, and incapacity to make judgments in life. The patient may have significant difficulties with ADLs, emotional instability, agitation from his impairment, and even panic attacks.
OBJECTIVE:_ To evaluate the effect of Benson's relaxation technique on depression, anxiety, and stress in post stroke patients.
METHODOLOGY: 30 subjects with post stroke are taken into consideration from large number of subjects. The subjects are selected by proper screening, fulfilling the both inclusive and exclusive criteria. Once selected, the participants will be assigned randomly to either, experimental (n=15) or control (n=15) groups. The control group received routine care [conservative treatment only] and experimental group received the Benson relaxation technique along with conservative treatment for 12 sessions of 60-minute thrice a week for 4 weeks. The DASS-21 scale was completed by samples before and after the intervention.

KEY WORDS: Post stroke, Depression, Anxiety, stress, Benson's Relaxation technique, DASS-21 Scale [Depression, Anxiety, Stress scale-21].

INTRODUCTION

The World Health Organization (WHO) defines a stroke as a sudden onset of clinical symptoms indicating a localized or widespread disruption of brain function. These symptoms persist for at least 24 hours or result in death, with no identifiable cause other than a vascular origin.[1]

Globally, 85.5% of stroke-related deaths occur in low- and middle-income countries. Additionally, the number of years lost due to disability-adjusted life expectancy in these nations is approximately seven times higher than in high-income countries. [2]

In India, stroke is a serious health issue. Reliable stroke morbidity and mortality figures are currently difficult to obtain in India due to several issues, including missing death certificates, inaccurate death classifications, and confusion regarding the

cause of sudden deaths and various co-morbidities.[3]

The age group under 50 years old and those with lower socioeconomic position had a higher prevalence of stroke in India. In India, there is a 7:1 male to female stroke ratio. Smoking and drinking, which are generally more common in men, are the risk factors that are extremely probable. [4]

With a global prevalence of 101 million and an incidence of 12 million in 2019, stroke ranks third in the globe in terms of disability and mortality.[5]

Globally, it was responsible for 6.55 million deaths and 143 million disability-adjusted life years (DALYs) in 2019.[6]

In normal individuals, the rate of emotional disability is 11.2%.[7]

Many stroke patients may exhibit behavioral problems such as hostility, anxiety, or inattention, and some may even be contemplating their future. The main clinical techniques used to assess stroke are symptom assessment, neurological examination, and investigations such as CT scan, MRI, PET, transcranial and carotid doppler, cerebral angiography, EEG 1101, and computerized tomography (CT) scan.[8]

After a stroke, anxiety is the second most prevalent neuropsychiatric aftereffect.[9]

About 20–30% of stroke survivors experience anxiety at some point following their stroke.[10]

After a stroke, most patients frequently experience emotional and behavioral changes since the brain controls all our emotions and behavior. This is because stroke alter the brain. A person may become confused, forgetful, agitated, or reckless after suffering a stroke-related injury. Anxiety, rage, or melancholy can also be felt by stroke victims. Individuals who have diminished motor function typically go through a stressful period due to pain, lack of control when performing formerly easy chores, and difficulty making crucial life decisions. Stroke patients may report significant impairments to their ADLs. Individuals with disabilities may have emotional disruption, irritability, and occasionally panic episodes.[11]

Stroke frequently results in depression, with reported rates of post-stroke depressive disorders ranging from 18% to 61%. Post-stroke depression (PSD) is linked to longer hospital stays, poorer rehabilitation progress, and potential difficulties with a patient's participation in therapy.[12]

Studies on relaxation methods have demonstrated that these easy techniques can improve energy levels, reduce weariness, and raise alertness from a sleepy state. Additionally, it has been demonstrated to boost productivity, motivation, and decision-making skills. Deep breathing exercises, gradual relaxation, and guided imagery are used as relaxation methods.[13]

The relaxation technique is one of the inexpensive complementary medicine therapies that doesn't require specific equipment or a doctor's prescription.[14]

Benson's (1970) relaxation technique is one of the simplest to administer and learn among relaxation techniques.[15]

The Benson relaxation technique does not require special equipment or a doctor's prescription, in contrast to many other relaxation techniques that make people drowsy, raise stress and anxiety, and are difficult to master. Complete relaxation is felt for at least four or five sessions.[16]

Benson technique is a form of mental imagination technique in which one can accomplish relaxation using all the senses and creative vision and often focuses on muscle relaxation and good concentration skills.[17]

INCLUSION CRITERIA:

- Patient diagnosed with right or left side CVA (3 months-1year) post stroke
- Both male and female
- Age group 30-70
- Patient with MMSE score above 20

EXCLUSION CRITERIA:

- Patient with severe cognitive or communication difficulties like speech disorder.

- Patient with psychotic disorders, sleep disorders, or any previous history of schizophrenia.
- Presence of any co-morbidity such as painful musculoskeletal conditions

OUTCOME MEASURES:

- DASS-21 [Depression anxiety and stress scale]

PROCEDURE

A study was conducted involving 30 post-stroke patients who were chosen based on specific selection criteria. After being selected, they were randomly divided into two groups: an experimental group (n=15) and a control group (n=15). The control group received only conventional conservative treatment, while the experimental group was given Benson's relaxation technique in addition to conservative treatment. The intervention lasted for four weeks, with a total of 12 sessions, each conducted for 60 minutes, three times per week.

The conservative treatment plan included proprioceptive neuromuscular facilitation (PNF), muscle strengthening exercises, stretching routines, range of motion (ROM) exercises, gait training, balance improvement exercises, dexterity enhancement, functional training, and electrical stimulation therapy.

Before starting the intervention, participants' levels of depression, anxiety, and stress were evaluated using the Depression, Anxiety, and Stress Scale-21 (DASS-21). Those who had scores of 30 or higher were included in the intervention program. After completing the four-week program, a reassessment was conducted using the same scale to measure changes in mental health status.

DASS-21 is a standardized tool consisting of 21 items that help assess levels of depression, anxiety, and stress. The score classification is as follows: 0–16 (normal), 17–20 (mild), 21–25 (moderate), 26–29 (severe), and 30 or more (extremely severe). Participants were assessed before and after the intervention to obtain objective data on psychological changes.

Benson's relaxation technique was introduced as a method to reduce stress. The following steps were followed during the sessions:

1. Find a comfortable sitting position.
2. Close your eyes.
3. Allow your entire body to relax.
4. Inhale naturally through your nose, paying attention to your breathing. As you exhale, mentally repeat the word "ONE" in a calm and silent manner. Maintain a steady breathing rhythm.
5. Continue the process for 10 to 20 minutes. If necessary, check the time without using an alarm. Once the session is complete, remain seated for a few minutes—first with eyes closed, then open. Avoid standing up immediately.
6. It may take time to achieve a deep relaxation state. If your mind wanders, start again. With regular practice, the ability to relax will improve. This technique should be done once or twice daily, ensuring at least a two-hour gap after eating to prevent digestive interference.

Each session lasted 30 minutes and was divided into two phases: the first 15 minutes with eyes closed and the remaining 15 minutes with eyes open. The practice was done twice a day, maintaining a two-hour gap between sessions. The four-week intervention period provided adequate time to assess its effectiveness in improving psychological well-being.

Figure1: consent form

Figure2: Benson's technique

Figure3:PNF

Figure4: Stair climbing

STATISTICAL ANALYSIS

The statistical analysis was done using SPSS 23.0. The categorical variables were represented in frequency and percentage. Numeric variables were represented using mean and standard deviation. Pre-post comparison was done using Paired Sample t Test. Comparison between groups were done using Independent Sample t Test. A p value <0.05 was considered statistically significant.

Table 1: Showing age of the population in Experimental Group and Control Group

		Mean	N	Std. Deviation	t value	p value
Age	Experimental group	52.267	15	12.192	0.529	0.605
	Control group	54.067	15	9.859		

The age comparison between the experimental and control groups reveals similar mean ages. The experimental group had an average age of 52.267 ± 12.192 years, and the control group had a mean age of 54.067 ± 9.859 years. Both groups consisted of 15 participants. The t-value is 0.529, and the p-value is 0.605, indicating that the difference in age between the groups is not statistically significant.

Figure 1: Representing mean age of the population in Experimental Group and Control Group

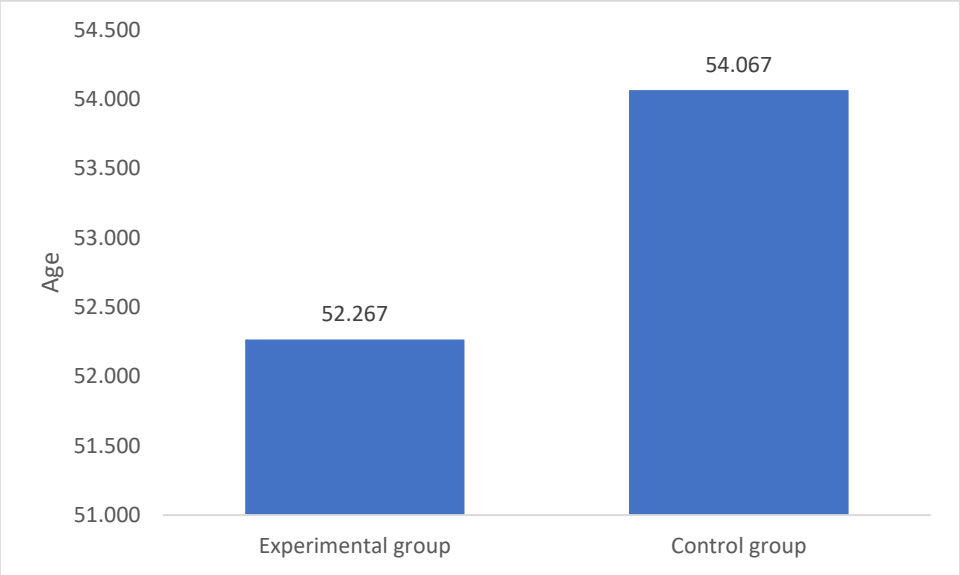


Table 2: Showing gender distribution in Experimental Group and Control Group

		Group		Total
		Experimental group	Control group	
Gender	Female	6	4	10
		40.0%	26.7%	33.3%
	Male	9	11	20
		60.0%	73.3%	66.7%
Total		15	15	30
		100.0%	100.0%	100.0%

In terms of gender distribution, the experimental group consisted of 40.0% females (6) and 60.0% males (9), with a total of 15 participants. The control group had a lower percentage of females, with 26.7% females (4) and 73.3% males (11), also totaling 15 participants.

Figure 2: Representing gender distribution in Experimental Group and Control Group

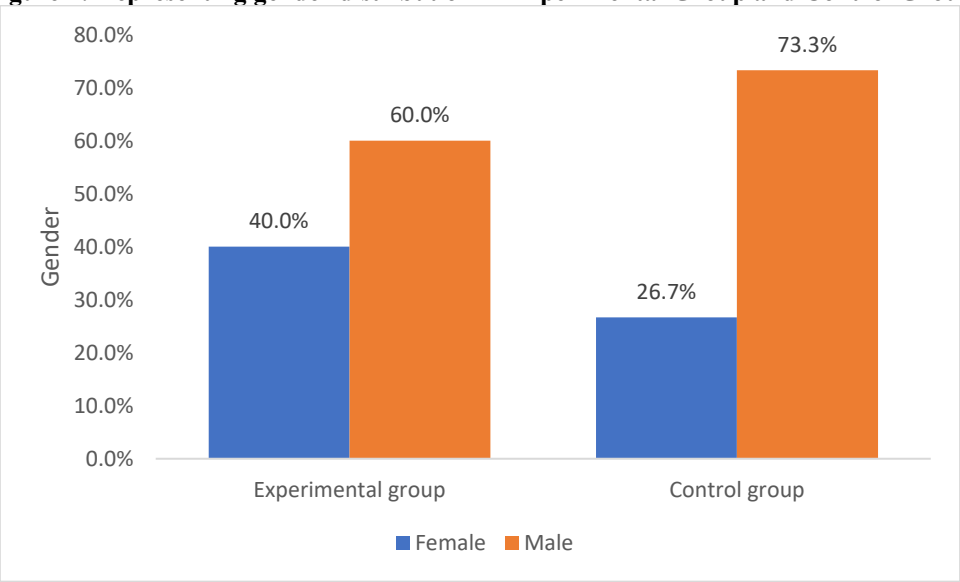


Table 3: Showing pre-post comparison of depression in Experimental Group and Control Group

Depression		Mean	N	Std. Deviation	Enhancement	p value	t value
Experimental group	Pre	15.800	15	2.210	8.133	14.114	p<0.001*
	Post	7.667	15	1.988			
Control group	Pre	16.467	15	1.356	6.933	11.168	p<0.001*

The depression scores for both the experimental and control groups were measured before and after an intervention.

In the experimental group, the mean depression score before the intervention (Pre) was 15.800 ± 2.210, and after the intervention (Post), it decreased to 7.667 ± 1.988. This represents a significant reduction in depression, with an enhancement of 8.133, and the p-value is $p < 0.001$, indicating a statistically significant difference.

In the control group, the mean depression score before the intervention (Pre) was 16.467 ± 1.356, and after the intervention (Post), it decreased to 9.533 ± 2.475, showing a reduction of 6.933. The p-value for this reduction is also $p < 0.001$, which indicates a statistically significant improvement.

Figure 3: Representing mean pre-post values of depression in Experimental Group and Control Group

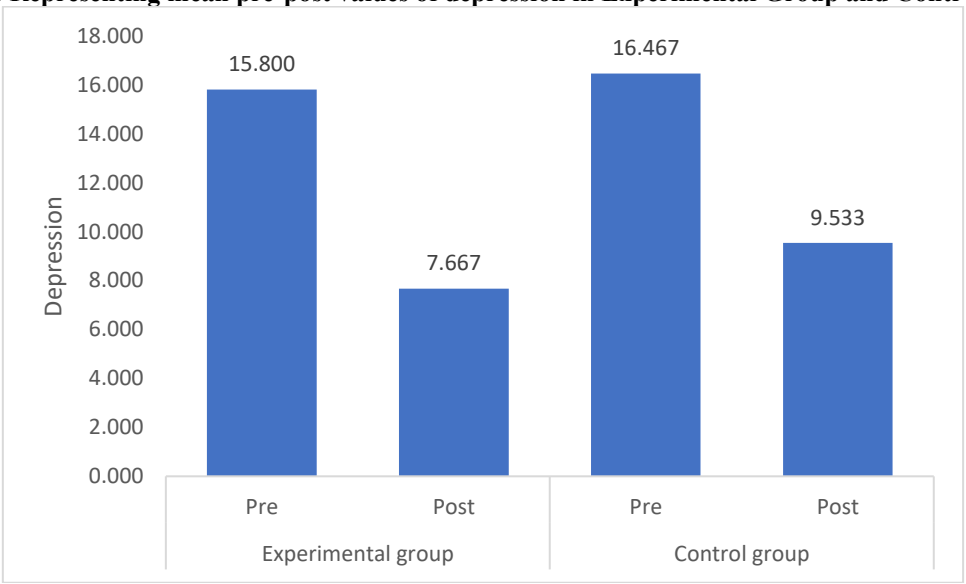


Table 4: Showing pre-post comparison of anxiety in Experimental Group and Control Group

Anxiety		Mean	N	Std. Deviation	Enhancement	p value	t value
Experimental group	Pre	14.467	15	2.264	6.066	7.683	p<0.001*
	Post	8.400	15	2.720			
Control group	Pre	16.067	15	1.668	6.066	13.741	p<0.001*
	Post	10.000	15	1.690			

The anxiety scores for both the experimental and control groups were assessed before and after an intervention.

In the experimental group, the mean anxiety score before the intervention (Pre) was 14.467 ± 2.264, and after the intervention (Post), it decreased to 8.400 ± 2.720. This reduction represents an enhancement of 6.066, with a p-value of $p < 0.001$, indicating a statistically significant decrease in anxiety.

In the control group, the mean anxiety score before the intervention (Pre) was 16.067 ± 1.668, and after the intervention (Post), it decreased to 10.000 ± 1.690, showing a reduction of 6.066. The p-value is also $p < 0.001$, suggesting a statistically significant improvement in anxiety levels for the control group.

Figure 4: Representing mean pre-post values of anxiety in Experimental Group and Control Group

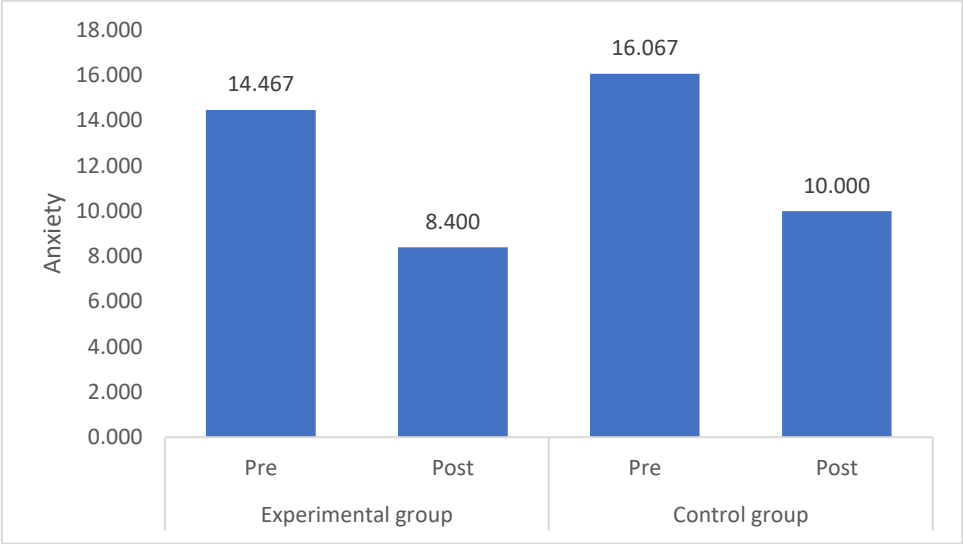


Table 5: Showing pre-post comparison of stress in Experimental Group and Control Group

Stress		Mean	N	Std. Deviation	Enhancement	p value	t value
Experimental group	Pre	14.867	15	2.295	7.066	14.349	p<0.001*
	Post	7.800	15	2.077			
Control group	Pre	16.867	15	2.134	5.733	8.527	p<0.001*
	Post	11.133	15	2.560			

The stress scores for both the experimental and control groups were evaluated before and after an intervention.

In the experimental group, the mean stress score before the intervention (Pre) was 14.867 ± 2.295, and after the intervention (Post), it decreased to 7.800 ± 2.077. This represents an enhancement of 7.066, with a p-value of $p < 0.001$, indicating a statistically significant reduction in stress levels.

In the control group, the mean stress score before the intervention (Pre) was 16.867 ± 2.134, and after the intervention (Post), it decreased to 11.133 ± 2.560, showing a reduction of 5.733. The p-value for this reduction is also $p < 0.001$, suggesting a statistically significant improvement in stress.

Figure 5: Representing mean pre-post values of stress in Experimental Group and Control Group

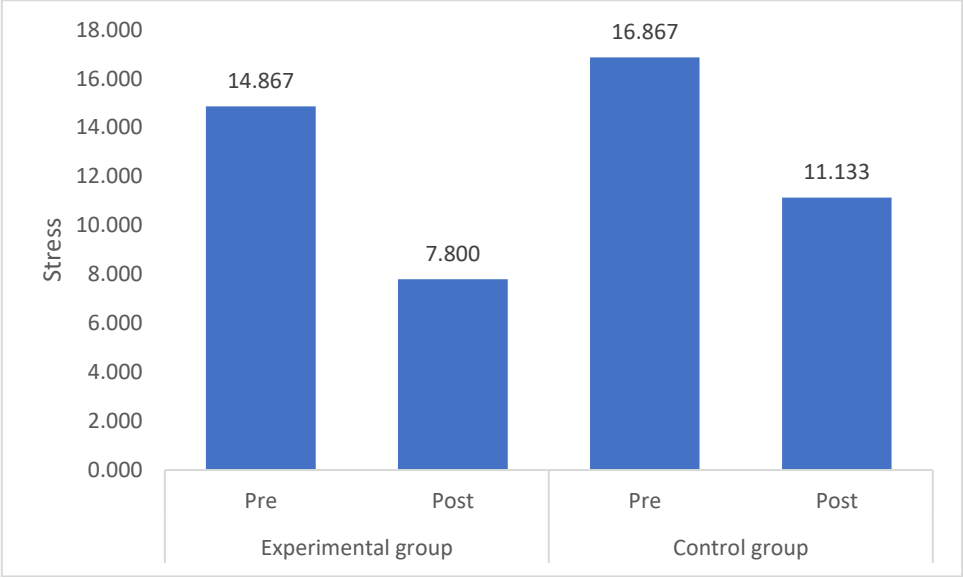


Table 6: Showing comparison of depression between Experimental Group and Control Group

Group		N	Mean	Std. Deviation	t value	p value
Depression	Experimental group	15	8.133	2.232	1.417	1.200
	Control group	15	6.933	2.404		

The depression scores for both the experimental and control groups were compared after an intervention. In the experimental group, the mean depression score was 8.133 ± 2.232, while the control group had a mean score of 6.933 ± 2.404. The calculated t-value is 1.417, and the p-value is 1.200suggests that there is no statistically significant difference between the depression scores of the experimental and control groups.

Figure 6: Representing mean of depression between Experimental Group and Control Group

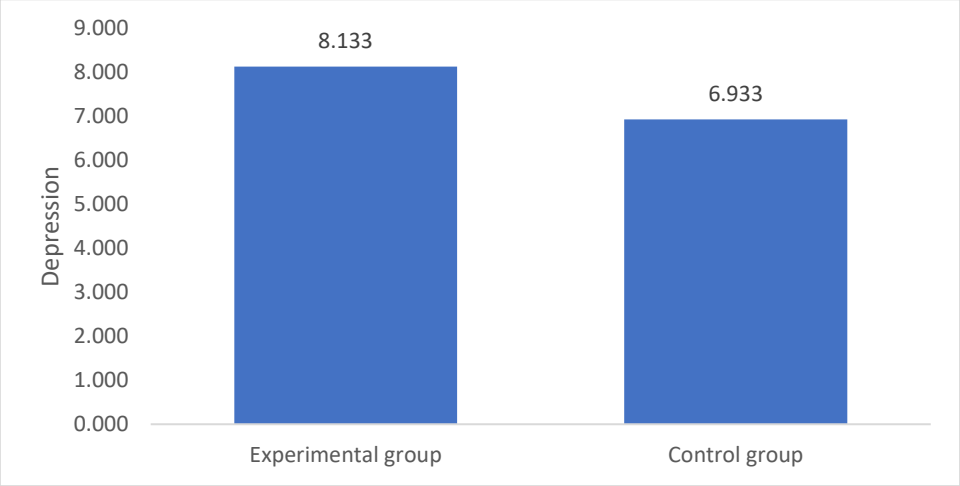


Table 7: Showing comparison of anxiety between Experimental Group and Control Group

Group		N	Mean	Std. Deviation	t value	p value
Anxiety	Experimental group	15	6.067	3.058	0.000	1.000
	Control group	15	6.067	1.710		

The anxiety scores for both the experimental and control groups were compared. In the experimental group, the mean anxiety score was 6.067 ± 3.058, and in the control group, the mean was also 6.067 ± 1.710. The calculated t-value is 0.000, and the p-value is 1.000indicates that there is no statistically significant difference between the anxiety scores of the experimental and control groups.

Figure 7: Representing mean of anxiety between Experimental Group and Control Group

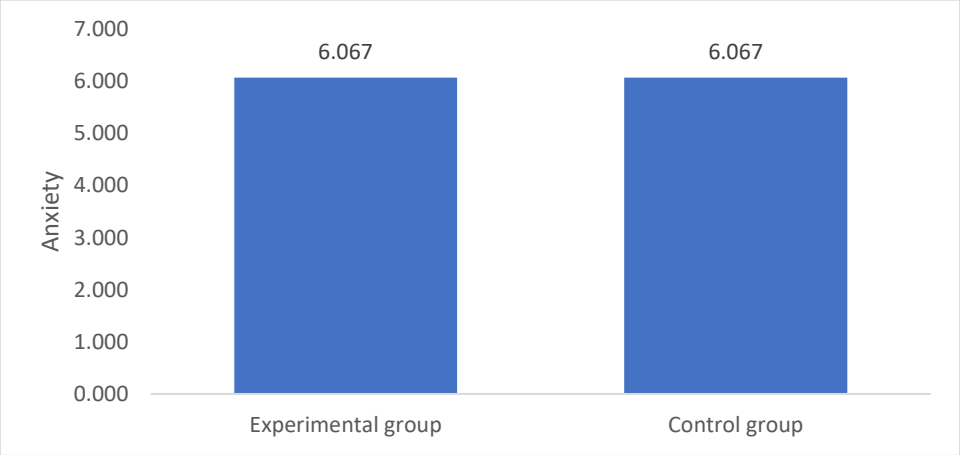
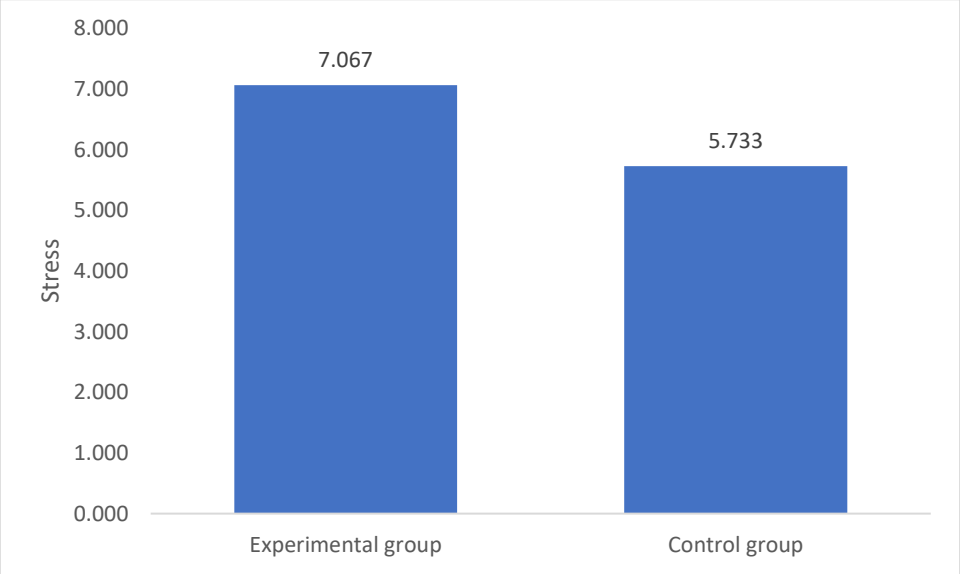


Table 8: Showing comparison of stress between Experimental Group and Control Group

Group		N	Mean	Std. Deviation	t value	p value
Stress	Experimental group	15	7.067	1.907	1.600	0.121
	Control group	15	5.733	2.604		

The stress scores for both the experimental and control groups were compared. In the experimental group, the mean stress score was 7.067 ± 1.907, while the control group had a mean score of 5.733 ± 2.604. The calculated t-value is 1.600, and the p-value is 0.121greater than the typical significance threshold of 0.05, indicating that there is no statistically significant difference between the stress scores of the experimental and control groups.

Figure 8: Representing mean of stress between Experimental Group and Control Group



RESULT

The study aimed to determine the effectiveness of Benson's relaxation technique in managing depression, anxiety, and stress among post-stroke patients using SPSS 23.0. Frequency and percentage were used to present categorical variables, while numerical variables were expressed as mean and standard deviation. To analyze the data, a Paired Sample t-Test was applied to compare pre- and post-intervention results within each group, and an Independent Sample t-Test was used to compare the outcomes between the experimental and control groups. A p-value of less than 0.05 was considered statistically significant.

The age distribution of the 30 participants indicated that both groups were similar in terms of average age. The mean age in the experimental group was 52.267 ± 12.192 years, while in the control group, it was 54.067 ± 9.859 years. Each group consisted of 15 participants, and the statistical analysis showed a t-value of 0.529 and a p-value of 0.605, suggesting no significant difference between the groups. Regarding gender distribution, the experimental group comprised 15 participants, with 40.0% being female (6) and 60.0% male (9). In the control group, 73.3% were male (11), while 26.7% were female (4), indicating a higher proportion of men in both groups.

The study evaluated depression levels before and after the intervention. In the experimental group, the mean depression score before the intervention was 15.800 ± 2.210, which significantly decreased to 7.667 ± 1.988 post-intervention, reflecting an improvement of 8.133 with a highly significant p-value of $p < 0.001$. Similarly, in the control group, the pre-intervention mean depression score was 16.467 ± 1.356, which

decreased to 9.533 ± 2.475 after the intervention, showing an improvement of 6.933 with $p < 0.001$, indicating statistical significance.

Anxiety levels were also analyzed before and after the intervention. The experimental group had a mean anxiety score of 14.467 ± 2.264 before the intervention, which dropped to 8.400 ± 2.720 after the intervention, showing a reduction of 6.066 with $p < 0.001$. The control group had a pre-intervention mean anxiety score of 16.067 ± 1.668, which declined to 10.000 ± 1.690 post-intervention, also reflecting a reduction of 6.066 with a p-value of $p < 0.001$, indicating a significant decrease in anxiety levels.

Stress levels were also assessed, with both groups showing substantial reductions. In the experimental group, the pre-intervention mean stress score was 14.867 ± 2.295, which significantly declined to 7.800 ± 2.077 post-intervention, reflecting an improvement of 7.066 with a p-value of $p < 0.001$. In the control group, the mean stress score before the intervention was 16.867 ± 2.134, which decreased to 11.133 ± 2.560 after the intervention, indicating a reduction of 5.733 with $p < 0.001$. These results suggest that while both groups showed improvements in depression, anxiety, and stress levels, the experimental group demonstrated a greater overall reduction.

A comparison of post-intervention depression scores between the experimental and control groups revealed no statistically significant difference. The experimental group had a mean depression score of 8.133 ± 2.232, while the control group had a mean score of 6.933 ± 2.404. The calculated t-value was 1.417, and the p-value was 1.200, indicating that the difference was not statistically significant. Similarly, for anxiety levels, both groups had identical post-intervention mean scores of 6.067, with standard deviations of 3.058 and 1.710, respectively. The t-value was 0.000, and the p-value was 1.000, confirming no significant difference in anxiety reduction between the two groups.

For stress levels, the post-intervention mean score in the experimental group was 7.067 ± 1.907, while in the control group, it was 5.733 ± 2.604. The t-value was 1.600, and the p-value was 0.121. Since the p-value was above the 0.05 threshold, the results indicate that there was no statistically significant difference in stress levels between the two groups.

In summary, the findings showed that although both groups experienced significant reductions in depression, anxiety, and stress after the intervention, there was no statistically significant difference between the experimental and control groups. The mean post-intervention depression score was 8.133 ± 2.232 in the experimental group and 6.933 ± 2.404 in the control group, with a t-value of 1.417 and a p-value of 1.200. The anxiety scores were identical in both groups at 6.067, with a t-value of 0.000 and a p-value of 1.000. The post-intervention stress scores were 7.067 ± 1.907 in the experimental group and 5.733 ± 2.604 in the control group, with a t-value of 1.600 and a p-value of 0.121. Since all p-values were greater than 0.05, the analysis indicates that the intervention did not lead to statistically significant differences between the two groups.

DISCUSSION

Stroke is a major health issue affecting the young today and causes long term disability. Anxiety strikes most patients as recovery consumes time and is also essential for post stroke survivors to lead a meaningful and productive life. Anxiety is evident in such patients.

This study aimed to assess the impact of Benson's relaxation techniques on depression, anxiety, and stress in individuals post stroke. The findings indicated that after learning and practicing these relaxation methods, post stroke patients experienced a reduction in their levels of depression, anxiety, and stress.

In this study, subjects with post stroke with depression, anxiety, and stress are taken consideration. Subjects are selected by proper screening and fulfilling the inclusive

and exclusive criteria. 30 patients with post stroke with depression, anxiety, stress was selected and grouped randomly into experimental and control groups. The experimental group received both Benson's relaxation technique and conservative treatment were as controlled group received only conservative treatment. Treatment duration was about 30 minutes.

The outcome measures used were DASS21(depression, anxiety, and stress scale) Each measurement was assessed on the day 1 of treatment and day 12 of the treatment. Then data were analyzed statistically.

Statistical data reveals that there is statistically significant improvement in depression, anxiety, and stress in pre and post intervention of both experiment and controlled group but there is no significant improvement in post intervention values between experimental and control group.

In the present study, the results show the ages of stroke patient in both groups were analyzed. The age comparison between the experimental and control groups reveals similar mean ages. The experimental group had an average age of 52.267 ± 12.192 years, and the control group had a mean age of 54.067 ± 9.859 years. Both groups consisted of 15 participants. These findings are consistent with the study done by Carlos M.Meclon. et.al show similar result [18] Yet another study done by Black Schaffer RM et al. show similar results. [19]

In this present study, the overall gender outcome indicates that the experimental group consisted of 40.0% females (6) and 60.0% males (9), with a total of 15 participants. The control group had a lower percentage of females, with 26.7% females (4) and 73.3% males (11), also totaling 15 participants. A study done by Turtzo LC et al. also yields similar results stating that the prevalence of stroke is predominantly in males as per the result.[20]Yet another study done by Pandian JD et al. also shows the similar Results as the present study stating that the prevalence of stroke is same Predominantly in males as per the results.[21]

Yet another study done by Bharati B et al. also yields the same results stating that shows that stroke is more prevalent in males than females.[22]

Relaxation techniques offer valuable physical and mental health benefits for patients. [23] This method helps regulate the balance between the posterior and anterior hypothalamus, minimizing the negative effects of stress and anxiety by decreasing sympathetic nervous system activity. It also reduces muscle tension, promoting physical relaxation and mental calmness. [24]

However, this study had some limitations: the effects of individual differences of the subjects in response to the intervention on their perception of the effect of relaxation technique on improving symptoms, Therefore, it is suggested that in future studies, the effect of this intervention on other signs and symptoms of post stroke with a larger sample size be investigated.

CONCLUSION

The study aimed to evaluate the efficacy of Benson's Relaxation Technique in managing depression, anxiety, and stress in post-stroke patients. Both the experimental group, which received Benson's Relaxation Technique along with conservative treatment, and the control group, which received only conservative treatment, showed similar improvements in emotional well-being after four weeks of intervention. This indicates that while Benson's Relaxation Technique may have therapeutic value, conservative treatment alone was equally effective in reducing depression, anxiety, and stress. These findings emphasize the need for a holistic rehabilitation approach that incorporates both physical and psychological interventions to enhance recovery in post-stroke patients.

Declaration by Authors

Ethical Approval: Approved

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Conflict of Interest: No conflicts of interest are disclosed by the author.

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