International Journal for Multidisciplinary Research (IJFMR)
E-ISSN: 2582-2160 ● Website: www.ijfmr.com ● Email: editor@ijfmr.com

Effect of Benson's Relaxation Technique on Anxiety, Fatigue and Quality of Sleep in patients with Sleep Paralysis: A Randomized Clinical Trial

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ABSTRACT

Background: Sleep paralysis (SP) is a condition related in which there is difficulty in moving which occurs when a person is sleeping or just waking. While sleeping, the whole body relaxes, and the voluntary muscles do not move. This prevents people from injuring themselves when acting out dreams. A person may wake up while their body is in this relaxed state. This is called as 'sleep paralysis'. Sleep paralysis is relatively common but under studied phenomenon. Recent survey showed the general population for sleep paralysis is 7.6%. Research suggest that anxiety, fatigue and quality of sleep is affected due to sleep paralysis and corelation is found between them.

Aim: To study the effect of Benson's Relaxation Technique on anxiety, fatigue and quality of sleep in patients with Sleep Paralysis.

Methodology: Participants were briefed about the nature of the study and the intervention. Their informed written consent was taken. 40 participants were selected based on the selection criteria. Prior and after the treatment the outcome measures that are Epworth Sleepiness Scale (ESS)
Unusual Sleep Experiences Questionnaire (USEQ), State -Trait Anxiety Inventory (STAI) scale ,Chalder Fatigue Scale (CFQ) and Pittsburgh Sleep Quality Index (PSQI) were taken. Intervention protocol Benson's Relaxation Technique was given for 8 weeks.

Result: There is a significant statistical reliable difference between the pre & post treatment values with p-value is less than the 5% significance level (i.e. $0.001 < 0.05$) in the study and therefore it indicates the strong evidence that there is a significant difference between the pre-test and post-test scores of anxiety, fatigue and quality of sleep in sleep paralysis patients after Benson's Relaxation technique.

Conclusion: The present study concluded that Benson's Relaxation Technique has a significant effect on reducing anxiety , fatigue and improving quality of sleep in sleep paralysis patients.

Keywords: Sleep paralysis, anxiety, fatigue , quality of sleep , Benson's Relaxation Technique.

INTRODUCTION

Sleep paralysis (SP) is a phenomenon characterized by the temporary inability to move or speak upon awakening or falling asleep, often accompanied by vivid hallucinations. With a reported prevalence of 7.6% in the general population, SP poses significant challenges to affected individuals, impacting their

quality of life and psychological well-being. Among university students, prevalence rates range from 21% to 42%, with no conclusive evidence of sex-based differences but a notable correlation with onset during puberty.

The human sleep cycle comprises two main phases: rapid eye movement (REM) and non-rapid eye movement (NREM) sleep, each consisting of distinct stages with varying levels of muscle tone, brain activity, and eye movements. During REM sleep, characterized by heightened brain activity and muscle atonia, individuals often experience vivid dreams while being physically paralyzed. The transition between wakefulness and REM sleep involves complex interactions within the brain, particularly involving the pontine brainstem structures.

SP episodes are often categorized into isolated, recurrent, and recurrent isolated types, with varying degrees of association with sleep disorders such as narcolepsy. Common features include muscle atonia, hallucinations, and feelings of fear or dread, with hallucinations typically falling into three categories: intruder, incubus, and vestibular-motor.

Numerous risk factors contribute to the occurrence of SP, including stress, irregular lifestyle, dietary habits, and mental health disorders such as anxiety and narcolepsy. Recent research has highlighted the significant impact of stress and fatigue on sleep quality and the manifestation of SP episodes.

Despite the prevalence and impact of SP, there is a notable lack of published clinical trials or outcome data on its treatment. Non-pharmacological interventions, including cognitive-behavioral approaches, auto-hypnosis, and relaxation techniques, have shown promise in improving symptoms and enhancing sleep quality. Benson's relaxation technique (BRT), in particular, has emerged as an effective and cost-efficient method for alleviating SP-related symptoms and improving overall sleep quality.

In this study, we aim to investigate the efficacy of relaxation techniques, specifically Benson's relaxation technique, in reducing anxiety ,fatigue and improving sleep quality.

METHODOLOGY

A randomized, non-blinded, experimental clinical study was conducted on 40 patients with Sleep Paralysis. Institutional Ethics committee approved the research. A written informed consent was obtained from the participants, those who met the inclusion and exclusion requirements. All the subjects were assessed at baseline as well as after a treatment period of 8 weeks.

Subjects above 18 years of age, who scored more than 10 on Epworth Sleepiness Scale were considered eligible for the study and the Unusual Sleep Experiences Questionnaire was also given, those who experienced Sleep Paralysis were included in the study. Subjects with Central Nervous System Tumours, Metabolic disorders, Patients on anti-depressant medication, being diagnosed with unstable hypertension, arrhythmia, cardiac angina, congestive heart failure, acute cerebrovascular accident, and hepatic failure were excluded based on medical history and documentation from the study.

INTERVENTION

The six steps of Benson’s relaxation technique were as follows:

1. Assume a comfortable position
2. Close the eyes gently;
3. Deeply relax all the muscles of your body. Start from the sole and gradually move towards face. Keep muscles relaxed.

4. Breathe normally through your nose. Try to become aware of your breathing and say a single word softly at each exhalation (eg.ONE)
5. Continue this exercise for 15–20 minutes. Try to keep all your muscles relaxed. After 15–20 minutes, open your eyes gently and remain in place for a few minutes.
6. Avoid being worried about whether having relaxation or not. Instead, let relaxation happens gradually. Push away disturbing thoughts
   (Patients were asked to perform the relaxation exercises at home on a daily basis for two months—60 sessions in total.) 8 weeks protocol.[7]

OUTCOME MEASURES

Epworth Sleepiness Scale was used to measure the rate of Daytime Sleepiness experienced while various daily acitivities in the subjects. The ranking ranges from 0 to 24, with a ranking above 10 indicating extreme daytime sleepiness .

Unusual Sleep Experiences Questionnaire is a self-report instrument which was used to assess sleep paralysis experience. The questionnaire includes nine open ended questions about the frequency, duration, age of onset and events surrounding sleep paralysis episode. Seventeen items quantified the intensity of subjective distress, physical symptoms and cognitive perceptions associated with SP episodes.

State -Trait Anxiety Inventory is a psychological inventory consisting of 40 self-report items on a 4-point Likert scale. The STAI measures two types of anxiety separately – state anxiety and trait anxiety .Scores range from 20 to 80.

Chalder Fatigue Scale is a self-administered questionnaire for measuring the extent and severity of fatigue within both clinical and non-clinical, epidemiological populations. It has 11 – items and score ranges 0 to 11.

Pittsburgh Sleep Quality Index is being used to measure sleep quality and patterns. It explains seven areas: subjective quality of sleep, sleep latency, sleep duration, habitual efficiency of sleep, sleep disturbances, use of sleep medication, and last month's daytime dysfunctions. Scoring of the answers is based on a scale of 0 to 3, whereby 3 reflects the Likert Scale negative extreme.

STATISTICAL ANALYSIS

Mathematical evaluation for the present study was performed by using Statistical Product to authenticate the results found. The data was filled manually into an excel sheet and then tabulated which was then subjected for evaluation for the same. Various mathematical evaluations such as mean, standard deviation were employed. The test for Normality for the data set was done using Shapiro wilk test . Wilcoxon test to assess pre-post changes in the data

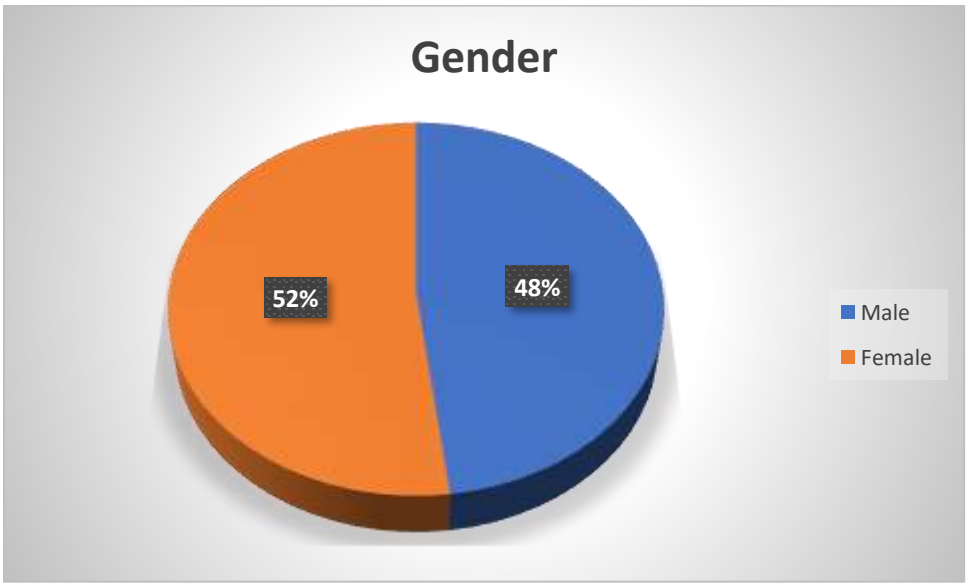
RESULTS

Descriptive Statistics:

Table No:1 -Variable – Gender

Gender	Frequency	Percent
Male	17	48
Female	23	52
Total	40	100

Graph representing Gender Distribution:

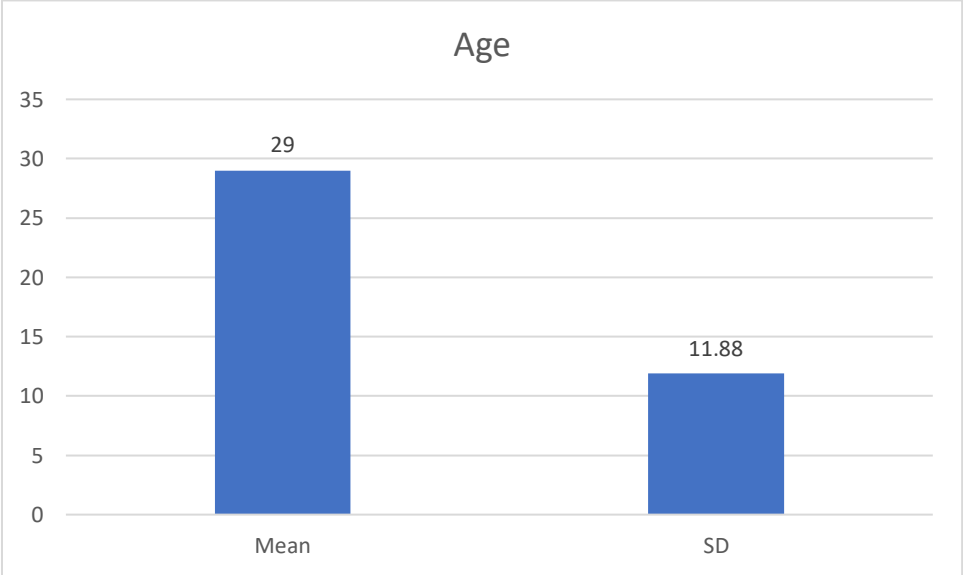


Graph No:1 shows gender distribution

Table No: 2-Variable – Age

Particular	Minimum	Maximum	Mean	SD
Age	19.00	64.00	29.00	11.88

Age Distribution:



Graph No:2 shows Age Distribution

Normality test using Shapiro-Wilk test:

H0: Data is normally distributed(p-value>0.05) i.e alpha=5%

H1: Data is not normally distributed

Table No :3- Shows z-value and P-value of outcome measures:

Variable	Time Frame	z-value	p-value
ESS	Pre	0.874	0.001
	Post	0.964	0.227
STAI	Pre	0.927	0.013
	Post	0.936	0.025
CFQ	Pre	0.861	0.001
	Post	0.929	0.016
PSQI	Pre	0.935	0.023
	Post	0.887	0.001

Data set is not normally distributed as all the variables have not indicated p-value greater than 0.05 in the observation. The researcher shall use non-parametric test for data analysis purpose in the following sections.

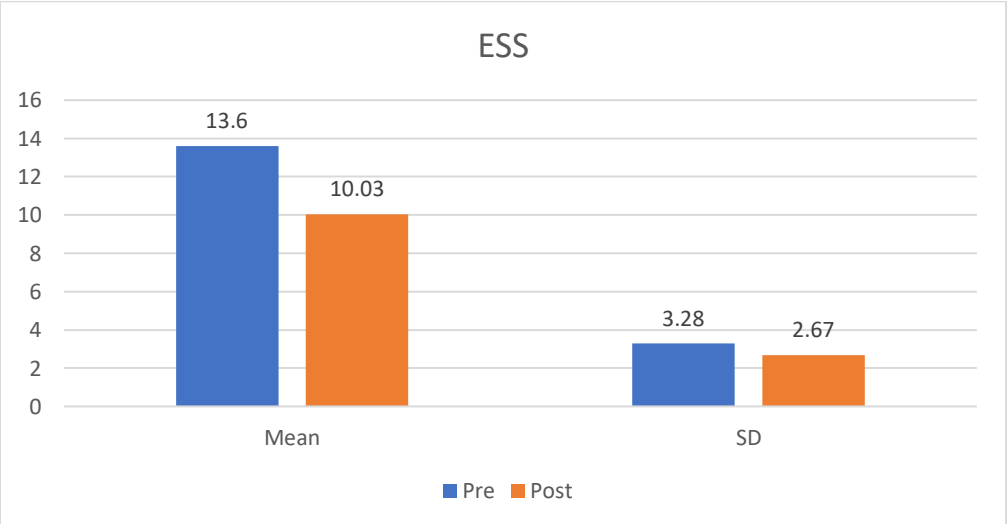
Pre and post test

Comparison of pre-test and post-test scores of ESS by paired sample Wilcoxon test:

Table No: 4 – shows Comparison of pre-test and post-test scores of ESS

Times	Mean	SD	Mean Diff.	SD Diff.	Effect size	z-value	p-value
Pre	13.60	3.28	3.58	1.57	2.28	5.549	0.001*
Post	10.03	2.67					

The mean value indicated changes post treatment and lower values are recorded for post treatment outcome and also the standard deviation shows the consistency with post treatment value which is less than pre value. The effect size or Cohen's D indicates 2.28 value which is assumed to be very high in effect size as per the standard parameters of reference. Based on the results of the test analysis at 5% significance level, there is a significant statistical reliable difference between the pre & post treatment values with p-value is less than the 5% significance level (i.e. 0.001 < 0.05) in the study and therefore it justifies the improvements in health outcome post intervention.



Graph No: 3 Comparison of pre-test and post-test scores of ESS

Comparison of pre-test and post-test scores of STAI by paired sample Wilcoxon test :

Table No: 5 – shows Comparison of pre-test and post-test scores of STAI

Times	Mean	SD	Mean Diff.	SD Diff.	Effect size	z-value	p-value
Pre	29.20	6.18	4.15	0.86	4.80	5.601	0.001*
Post	25.05	5.74					

The mean value indicated changes post treatment and lower values are recorded for post treatment outcome and also the standard deviation shows the consistency with post treatment value which is less than pre value. The effect size or Cohen's D indicates 4.80 value which is assumed to be very high in effect size as per the standard parameters of reference. Based on the results of the test analysis at 5% significance level, there is a significant statistical reliable difference between the pre & post treatment values with p-value is less than the 5% significance level (i.e. 0.001 < 0.05) in the study and therefore it justifies the improvements in health outcome post intervention.

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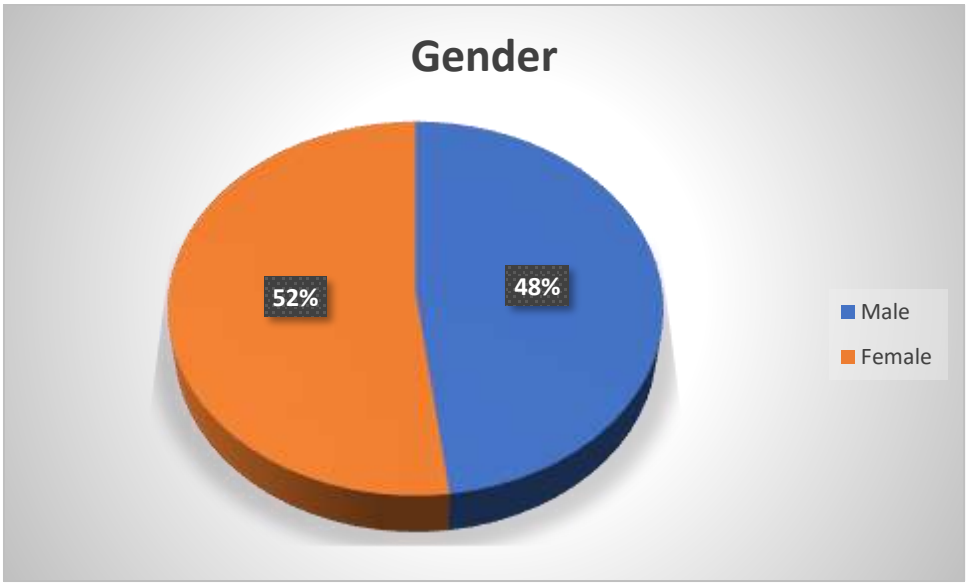

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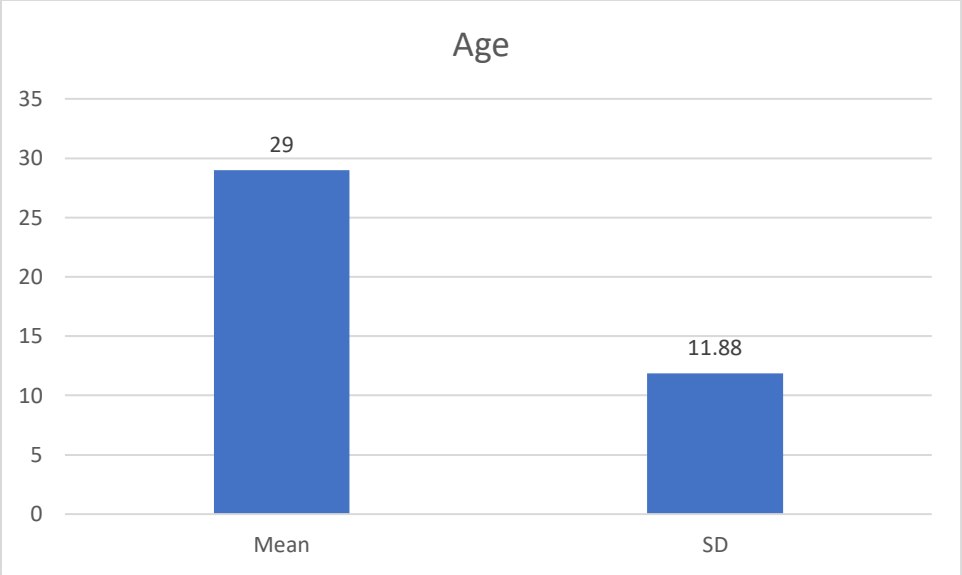

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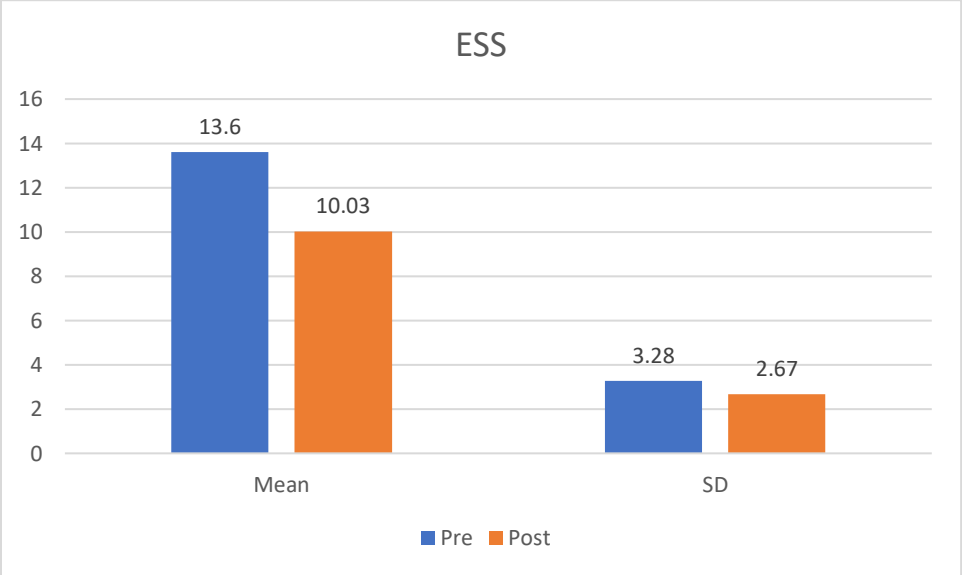

Graph No: 3 Comparison of pre-test and post-test scores of ESS

Comparison of pre-test and post-test scores of STAI by paired sample Wilcoxon test :

Table No: 5 – shows Comparison of pre-test and post-test scores of STAI

Times	Mean	SD	Mean Diff.	SD Diff.	Effect size	z-value	p-value
Pre	29.20	6.18	4.15	0.86	4.80	5.601	0.001*
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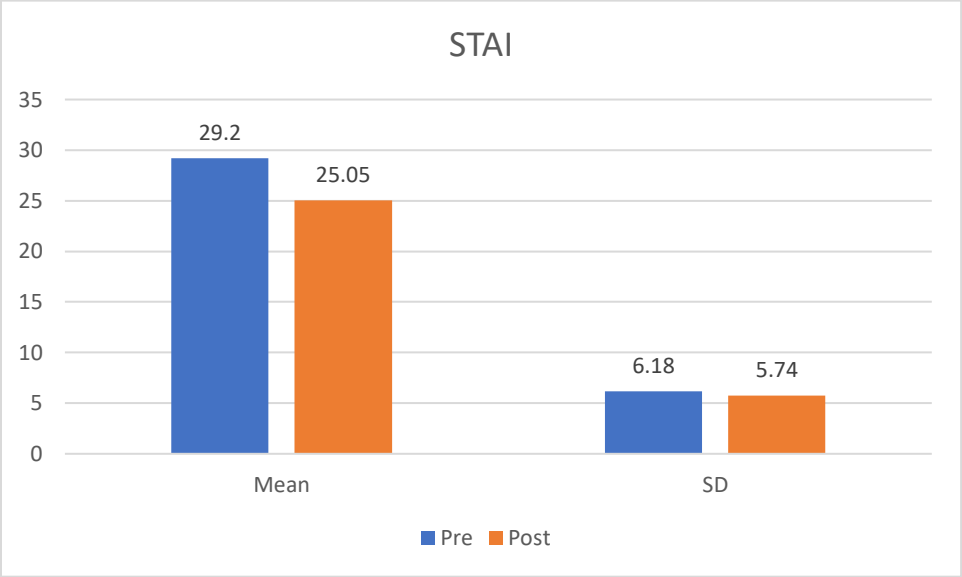


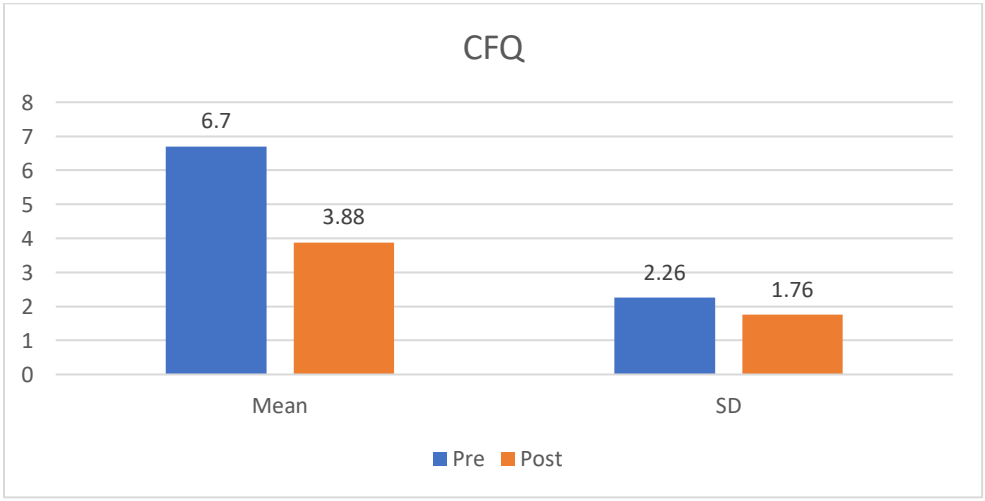
Graph No: 4 Comparison of pre-test and post-test scores of STAI

Comparison of pre-test and post-test scores of CFQ by paired sample Wilcoxon test :

Table No: 6 – shows Comparison of pre-test and post-test scores of CFQ

Times	Mean	SD	Mean Diff.	SD Diff.	Effect size	z-value	p-value
Pre	6.70	2.26	2.83	0.98	2.87	5.585	0.001*
Post	3.88	1.76					

The mean value indicated changes post treatment and lower values are recorded for post treatment outcome and also the standard deviation shows the consistency with post treatment value which is less than pre value. The effect size or Cohen's D indicates 2.87 value which is assumed to be very high in effect size as per the standard parameters of reference. Based on the results of the test analysis at 5% significance level, there is a significant statistical reliable difference between the pre & post treatment values with p-value is less than the 5% significance level (i.e. 0.001 < 0.05) in the study and therefore it justifies the improvements in health outcome post intervention



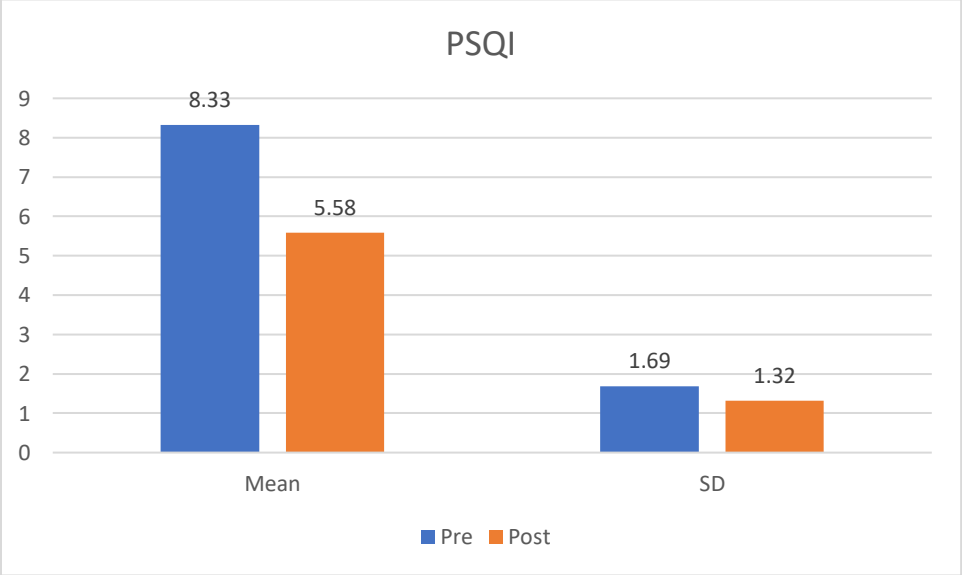
Graph No 5 : Comparison of pre-test and post-test scores of CFQ

Comparison of pre-test and post-test scores of PSQI by paired sample Wilcoxon test :

Table No: 7 – shows Comparison of pre-test and post-test scores of PSQI

Times	Mean	SD	Mean Diff.	SD Diff.	Effect size	z-value	p-value
Pre	8.33	1.69	2.75	1.39	1.98	5.419	0.001*
Post	5.58	1.32					

The mean value indicated changes post treatment and lower values are recorded for post treatment outcome and also the standard deviation shows the consistency with post treatment value which is less than pre value. The effect size or Cohen's D indicates 1.98 value which is assumed to be very high in effect size as per the standard parameters of reference. Based on the results of the test analysis at 5% significance level, there is a significant statistical reliable difference between the pre & post treatment values with p-value is less than the 5% significance level (i.e. 0.001 < 0.05) in the study and therefore it justifies the improvements in health outcome post intervention



Graph No: 6 Comparison of pre-test and post-test scores of PSQI

DISCUSSION

Sleep paralysis is relatively common but under studied phenomenon. The recent survey showed that the general population for sleep paralysis is 7.6%[2]

Previous research studies indicates that anxiety, fatigue, and sleep quality are impacted by sleep paralysis, and a connection has been identified between them. Currently, there is no specific treatment method targeted directly at sleep paralysis. However, some non-medication-based interventions have been suggested, such as cognitive behavioral techniques and Meditation-Relaxation (MR) therapy.

The purpose of this research was to study how Benson's Relaxation technique affected sleep paralysis patient's levels of anxiety, fatigue and quality of sleep when performing this technique. The study involved a total of 40 participants who were recruited from tertiary care hospitals and communities in Miraj and Sangli city,.

The Epworth Sleepiness Scale (ESS) and the Unusual Sleep Experiences Questionnaire (USEQ) were employed for the inclusion of participants. The State -Trait Anxiety Inventory (STAI) scale was used to assess anxiety in sleep paralysis. The Chalder Fatigue Scale (CFQ) was utilized to assess fatigue in sleep paralysis and to assess the quality of sleep in sleep paralysis we used Pittsburgh Sleep Quality Index (PSQI). Participants performed Benson's Relaxation Technique for 8 weeks.

The present study showed significant statistical reliable difference between the pre & post treatment values of STAI with p-value is less than the 5% significance level (i.e. $0.001 < 0.05$) in the study and therefore it justifies the improvements in health outcome post intervention

The results of the current study revealed a significant difference in the average anxiety scores surveyed after the BRT application.

This can be explained by the Benson technique being a simple, effective, safe, cost-effective relaxation technique that is easy to learn and does not require any additional equipment or resources.

Gradual increases in intensity and biomechanical movements during BRT sessions may reduce anxiety as it stimulates the parietal lobe and provides somatosensory input. This may lead to an increase in the neurotropic factor that improves physical and psychological functions.

These results are consistent with those of Amini et al. [21], who previously studied the effect of progressive muscle relaxation and aerobic exercise on anxiety, sleep quality, and fatigue. It has been said that BRT causes an increase in oxygen intake and an intensification of the energy production process. This plays an important role in reducing anxiety levels and thus affecting sleep quality.

The present study showed statistical significant reduction in the average fatigue scores after BRT application. The test analysis at a 5% significance level reveals a statistically significant difference between the pre- and post-treatment values, as indicated by a p-value less than 0.05 (i.e., $0.001 < 0.05$). This suggests that the improvements in health outcomes following the intervention are justified.

.A previous study on fatigue Alzaghmouri, Abeer Hisham, et al.[19],This study aimed to investigate the effect of BRT on fatigue level of patients diagnosed with MS in Jordan patients after BRT intervention showed significant improvement in overall fatigue level.

Benson's Relaxation Technique, which involves deep breathing, muscle relaxation, and focusing on a calming word or phrase, may impact fatigue through several physiological mechanisms - Stress can exacerbate fatigue by activating the sympathetic nervous system and releasing stress hormones like cortisol. Benson's technique induces the relaxation response, counteracting the stress response and promoting physiological calmness.

Chronic muscle tension contributes to feelings of fatigue. By systematically relaxing muscles, Benson's technique may alleviate this tension, leading to physical relaxation and decreased fatigue.

The relaxation response elicited by Benson's technique stimulates the parasympathetic nervous system, which promotes rest and recovery. This can help counterbalance the overactivation of the sympathetic nervous system associated with fatigue.

Deep breathing techniques used in Benson's method increase oxygen intake and promote better oxygenation of tissues. Improved oxygenation can enhance energy levels and reduce feelings of fatigue. Relaxation techniques have been shown to modulate neurotransmitter levels, such as serotonin and dopamine, which play roles in mood.

BRT intervention also showed significant improvement in quality of sleep. The test analysis at a 5% significance level reveals a statistically significant difference between the pre- and post-treatment values,

as indicated by a p-value less than 0.05 (i.e., 0.001 < 0.05). This suggests that the improvements in health outcomes following the intervention are justified.

These results are consistent with a previous research Efendi, Suradi, et al**,** who investigated the effect of Benson relaxation techniques on the quality of sleep in cancer patients .

By activating the body's relaxation response, it can improve sleep quality by calming the nervous system, lowering heart rate, and promoting a sense of well-being conducive to falling asleep and staying asleep.

Benson relaxation clinically and statistically affects the decrease in PSQI score of sleep paralysis patients.

CONCLUSION

This study concluded that Benson's Relaxation Technique has a significant effect on reducing anxiety , fatigue and improving quality of sleep in sleep paralysis patients.

ACKNOWLEDGMENT

I take this grateful opportunity to thank all the "HANDS" which have joined together to make this project a Success. It's my great pleasure and privilege to express my deep-felt gratitude to our respected Principal sir Dr..Fredrick John and Guide Dr. Vrushali Bhore who immensely helped me and rendered their advice, precious time, constant encouragement, knowledge and relevant information regarding my study, and whose suggestion and guidance has enlightened me on this subject. I express my sincere thanks to all the teaching & non - teaching staff of the Miraj Medical Centre, College of Physiotherapy. Above all, I would like to thank my parents for their blessings, love, constant support, affection and encouragement.

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