

EFFICACY TESTING: PROGRESSIVE MUSCLE RELAXATION TECHNIQUE(PMRT) IN INSOMNIACS YOUNG POPULATION ANALYSED BY EPWORTH SLEEPINESS SCALE

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ABSTRACT

BACKGROUND : Insomnia (sleep disorder) is the perception or complaint of inadequate or poor quality sleep, due to various factors ;waking up frequently during night and difficulty recurring to sleep. People may have primary or secondary insomnia. Insomnia also varies in how long it lasts, it may be Transient, Acute and Chronic. Symptoms can be – Sleepiness during the day, General tiredness, Irritability, Problems with concentration, attention or memory. Causes of insomnia include psychological factors, medications and hormonal levels and other factors. Progressive muscle relaxation (PMR) is an excellent fast and effective therapeutic technique for relaxing tight muscle. It was first developed by Dr. Edmund Jacobson in 1920. PMR builds awareness of sense of tension and deep relaxation in various muscle groups from head to feet. PMR has immediate and long term benefits for insomniacs. **OBJECTIVE :** To evaluate the Efficacy testing of Progressive Muscle Relaxation Technique(PMRT) in insomniacs young population by using Epworth Sleepiness Scale(ESS). **METHODOLOGY :** In the Department of Physiotherapy (PMR), M.G.M Medical College, a total of 70 young population were diagnosed with insomnia, Out of that 70, 60 young population fulfilled the inclusion criteria and initially selected for the study. 6 young insomniacs were dropped out, because of certain reasons and not co-operative to the treatment leaving 54 young insomniacs for study. 54 young insomniacs had actively participated in the intervention. **TECHNIQUE :** Before and after intervention the ESS scoring method was used for recording the insomnia. 54 insomniacs included in the study were randomly assigned to group Pre-test/Post-test research design. For 12 weeks, the participants received PMR treatment for 4 sessions per week for 45-50 minutes. After PMR interventions ESS score were measured again. In insomniacs PMRT was used to improve sleep quality by applying tension on the specific group of muscle and then relax them alternatively, for experience the relaxation. **RESULT:** Insomniacs demonstrated significant improvement in ESS score ($P<0.05$) in reduce stress, sleep quality and sleep duration and experience relaxation. Therefore, PMRT has more effective result as for improving the sleep quality results and experience much relaxation in insomniacs. **CONCLUSION:** On the basis of the results obtained in the present study it was concluded that PMRT was clinically effective for treating Insomnia to revamp ESS score.

KEYWORDS : Insomnia, PMRT (Progressive Muscle Relaxation Technique), ESS(Epworth Sleepiness Scale), PMR (Progressive Muscle Relaxation).

INTRODUCTION

Sleep is one of those soothing pleasures that is easy to take for granted. Sleep is basic need. Like breathing and eating, we need sleep in order to survive. We know that poor sleep has an adverse impact on daily life. These negative changes can be through effects such as reduced intellectual and physical performance, low mood and changes in appetite (usually increased).

Insomnia – A sleep disorder. It was 1st described by Alexander Pushkin (1830). The National Sleep foundation released the result of a world class study for sleep duration range for different age individuals.

- New born (0-3 months) – 12-18 hours.
- Infants (4-11 months) – 12-15 hours.
- Toddlers (1-2 years) – 11-14 hours.
- Pre-schoolers (3-5 years) – 10-13 hours.
- School age children (6-13 years) – 9-11 hours.
- Teenagers (14-17 years) – 8-10 hours.
- Young Adults (18-25 years) – 7-9 hours.
- Adults (26-64 years) – 7-9 hours.
- Older Adults (65+ years) – 7-8 hours.

Insomnia disrupts or destroy the person's daily life. It regularly affects millions of people worldwide specially youngsters. Insomnia can lead to difficulty in sleep, awake often during night and trouble during back to sleep, waking up too early in morning, daytime sleepiness, lethargy, general feeling of being unwell, both mentally and physically, mood swings, irritability and anxiety. People may have primary insomnia or secondary insomnia.

In primary insomnia patient is having sleep problem but not associated with any other health condition. In secondary insomnia, patient is having sleep problem because of health conditions like (Asthma, depression, arthritis, cancer or heartburn.) It is more common in older adults, shift workers, and people with medical or psychological disorders .Most common causes of insomnia are stress, anxiety, and depression. Women are more affected from insomnia. Hereditary factor also cause insomnia, especially in cases where insomnia starts early in life. There are some medical conditions where sleep is commonly described as being non-refreshing leaving the person feeling fatigued and restless. This would include conditions such as fibromyalgia, certain infections such as hepatitis-C and certain neurological conditions such as multiple sclerosis. In all of these, people might feel that their quality of sleep is impaired and they have a sense of fatigue during the day. Insomnia also varies in how long it lasts, and how can it occur. It can be transient, acute and chronic.

- Transient insomnia – symptoms last up to 3 nights.
- Acute insomnia – for short period – one night to few weeks.
- Chronic insomnia – for long duration – 3 nights in a week for 3 months and longer.

90% of general population suffer from acute insomnia and 10% of chronic insomnia. Insomnia affects people of all ages, including children, more common in adults and its frequency increase with age .According to National Sleep Foundation 30-40% of younger adults & adults suffer from insomnia each year. Causes of insomnia are as follows:

- Disruption in circadian rhythm – Job shift changes, high altitudes, environmental noise, extreme heat and cold.
- Psychological issues – Bipolar disorder, depression, anxiety disorder or psychotic disorder.
- Medical conditions – Chronic pain, chronic fatigue syndrome, angina, COPD, congestive heart failure, sleep Apnea, Parkinson, Hyperthyroidism, Alzheimer disease, arthritis, brain tumor, stroke.
- Hormonal levels – Estrogen hormone shift during menstruation.
- Other factors – Sleeping next to a snoring partner, parasites, genetic conditions, overactive mind, pregnancy.

Symptoms associated with insomnia are poor concentration and focus, being un-coordinated, tension, headache, difficulty socializing, gastro-intestinal symptoms, mood changes, worrying about sleeping, increase errors and mistakes, sleep hygiene. Evidence suggests physiological arousal in individuals with insomnia have a more active sympathetic nervous system than healthy people. Insomniacs have greater

sympathetic hyperactivity during the day and night. There is also evidence for high cortical activation in insomnia and have greater activation in brain regions involved in the regulations of sleep.

PMRT-

Progressive muscle relaxation technique is a effortless therapeutic technique that relaxes your mind and body, to reduce stress and build awareness of sense of tension and deep relaxation in various muscle groups from head to feet. Progressive relaxation is an excellent technique for relaxing tight muscle. It was developed by Dr. Edmund Jacobson in the early 1920's. The progressive muscle relaxation technique is a fast and effective method, that has number of benefits - immediate benefits and long term benefits. PMR has two steps procedure-

- i. Tension on the targeted muscle.
- ii. Relaxing the tensed muscle.

Progressive muscle relaxation can be done lying down or sitting. It is very important do not strain or overly tense the muscle. Make sure to not hold your breath during this practice. When going through the PMR exercise, it is recommended to start at one part of your body and more systematically. You may do one side of the body (hand, arm, leg, foot) at a time, or do both sides at the same time. PMRT was originally used to treat symptoms of anxiety, but more recently it has been found to be effective for treating tension, headache, migraine insomnia, Temporomandibular joint, neck pain, bipolar disorder, high blood pressure. PMR is a recommended practice to relax the body and mind at bed time to fall asleep more easily and get a deeper night sleep.

Author (Freeman) suggests that PMR convey health benefits in 3 ways:

- Utilizing the effect of PMR to manipulate autonomic responses.
- Increase or activates the production of opiates.
- Promotes optimal immune function:

PMR technique facilitates sympathetic arousal by training the individual to reduce oxygen requirements achieved by the repetitive release of muscle tension combined with slowing of respiration. This makes it a useful therapeutic intervention for panic, phobias and anxiety states.

AIMS AND OBJECTIVES

Aim of Study :

The aim of the study is to analyze the effectiveness of progressive muscle relaxation technique in young insomniacs.

Objectives:

- To assess the score on Epworth Sleepiness scale among young population at pre intervention stage.
- To assess the score Epworth Sleepiness scale among young population at Post intervention stage.
- To identify the effectiveness of PMRT (Progressive Muscle Relaxation Technique) in young population having insomnia.

MATERIALS AND METHODS

HYPOTHESIS

Null hypothesis [H⁰]:

- There will be no significant efficacy testing of PMRT for insomnia in young population.

Alternative hypothesis [H¹]:

- There will be significant efficacy testing of PMRT for insomnia in young population.

STUDY RESEARCH DESIGN: The design of study is Pre-experimental 1 group pre-test post-test design.

SAMPLING METHOD: A Random sampling technique was used for this study. Samples that met inclusion-exclusion criterion had chosen from the young population having insomnia by using random sampling technique (Lottery Method) at sampling stage one. At sampling stage two, allocation of a group for a specific treatment (PMRT) to a sample was also done using random sampling technique.

PREPARATION AND ORGANIZATION OF DATA: Young population having insomnia of selected from Department of physiotherapy, M.Y. Hospital, Indore, had aged from 18 to 28 years suffered from symptomatic acute and chronic insomnia as established by daytime sleepiness, general tiredness of being unwell and less sleeping hours (less than 5 hours) involvement that further met the inclusion-exclusion criteria chosen for study. A total of 70 young population having insomnia had screened for the study and out of them 60 had fulfilled the inclusion criteria selected randomly by using random sampling technique (Lottery method) from a total of 70 young insomniacs. Out of 60 young insomniacs, 6 young insomniacs were dropped out, because of certain reason and not co-operative to the PMR treatment, leaving 54 young insomniacs for the present study and had actively participated in the PMR intervention. These 54 young insomniacs received Progressive Muscle Relaxation Technique. However, the main aim of this study is to analyze the effectiveness of PMRT in young insomniacs. Pre assessments (pre-test) of parameter among young insomniacs had carried out at sampling stage one. However, at sampling stage one the data for Epworth Sleepiness scale had obtained prior to intervention of selected for PMR treatment in young insomniacs designated as baseline observations. At sampling stage two, the data had re-collected at 12th week after intervention of selected treatment in young insomniacs and for further statistical analysis utilized as post-intervention observations. After necessary instructions and information about the study, the samples had explained about the complete study procedure in his/her own language and his/her willingness to participate in the study had recorded in a consent form signed by him/her. The young population having insomnia had analyzed before and after intervention in order to evaluate Epworth Sleepiness Scale (ESS Scale) to confirm the effectiveness of PMRT in young insomniacs.

SAMPLE SIZE: 54 Participants.

STUDY SETUP: Study was conducted at M.Y. Hospital, of MGM Allied Health Sciences Institute, Indore (M.P.)

STUDY DURATION: Study duration was around 10 months.

SUBJECT SELECTION CRITERIA-

Inclusion Criteria:

1. Students (Young population) of age group 18-28 years.
2. Gender, both males and females.
3. Symptomatic insomnia - acute or chronic involvement.
4. Limited sleeping hours (less than 5 hours).
5. Students (Young population) who have given the consent form.

Exclusion Criteria:

1. Students doing any physical sport activity.
2. Student having history of trauma of back, knee or ankle.
3. Student who had taken physiotherapy (PMR) treatment for back pain or knee pain.
4. Any neurological disorder.

STUDY TOOLS-

Before the beginning of the intervention protocol all the participants were evaluated in the following outcome measures.

- ESS Scale (Epworth Sleepiness Scale).
- Suitable room.
- Suitable chair.

OUTCOME MEASURES:

ESS (Epworth Sleepiness Scale):- This is the most widely used scale for recording the severity of insomnia and patient's level of sleepiness. Insomnia is classified according to Epworth Sleepiness Scale into 4 grades, where grade 0- No chance of dozing or sleeping, grade 1- Slight chance of dozing or sleeping, grade 2 - Moderate chance of dozing or sleeping, grade 3 – High chance of dozing or sleeping.

EPWORTH SLEEPINESS SCALE

Use this scale to determine your patient's level of sleepiness.

Choose the most appropriate number for each situation:

0 = no chance of dozing

1 = slight chance of dozing or sleeping

2 = moderate chance of dozing or sleeping

3 = high chance of dozing or sleeping

	Scoring
Situation Chance of Dozing or Sleeping	
Sitting and reading	
Watching TV	
Sitting inactive in a public place	
As a passenger in a motor vehicle for an hour or more	
Lying down to rest in the afternoon when circumstances permits	

Sitting and talking to someone	
Sitting quietly after lunch without alcohol	
In a car, while stopped for a few minutes in traffic	
Total Score (add the scores up)	

(This is your Epworth score)

If your patient scores 10 or more, we recommend your patient consult one of our physicians to treat a sleep disorder, address an underlying condition affecting sleep and develop proper sleep hygiene.

VARIABLES:

Dependent variable- Epworth Sleepiness scale

Independent variable- PMRT

INTERVENTION-

Duration of intervention-12 weeks, 4 sessions per week for 45-50 min. Pre & post treatment analysis is done by using ESS Scale.

PMRT (Progressive Muscle Relaxation Technique)

In PMRT, the patient was in relaxing sitting position. Technique of PMR was applied to relax the muscles, as well as improve sleep quality by applying tension on particular muscle group for 10 seconds then release the tension and relax that muscle group for 20 seconds.

The PMR was guided by the therapist as a verbal command. Stronger command resisted in order to feel relax and improve stress reduction level (not strain or overly tense the muscle). The PMR was used for following movements and relaxation with improve quality sleep, according to the different muscle functions and movements-

- 1. Chest:** Fill the lungs with air while feeling the tension in the chest area (Breathe in & hold). Breathe out (Relax).
- 2. Abdomen:** gently pull abdomen muscle towards the spine, hold then release.
- 3. Hand and forearm:** With the palm down, lift the hand until tension can be felt in the top of the hand, the wrist and the forearm.
- 4. Upper arm:** Tense the biceps and triceps by flexion and extension of the elbow.
- 5. Forehead:** Wrinkle the brows, hold then release
- 6. Eyes and cheeks:** Squeeze your eyes, tight shut, hold then release.
- 7. Jaw area:** Without damaging the teeth, bite down until tension can be felt in the jaw area then release.
- 8. Neck:** Face forward and then push your head gently and go back to the balance position, feel the difference.
- 9. Shoulder:** Shrug the shoulder towards the ear and roll the head towards the shoulder so that shoulder and ear are touching, hold these position then release.
- 10. Hips and buttocks:** Squeeze your buttock muscles together.
- 11. Upper leg:** Tense the top of the upper leg (quadriceps) and the bottom of the upper leg (hamstring).
- 12. Foot and lower leg:** Keeping the heel down, curl the toes back, hold until tension can be felt in the ankle and calf muscle.

Chest and Abdomen

Hand and Forearm

Upper Arm

Forehead



Eyes and Cheeks

Jaw Area

Neck

Shoulder



Buttocks

Upper Leg

Foot and Lower Leg



DATA ANALYSIS

The measurement of the sleep disorder of young population diagnosed with insomnia was done using score of Epworth Sleepiness scale and that carried out at two sampling stages in order to ensure the management of insomnia.

The sleep disorder among young population was measured at baseline (before) stage and after administration of progressive muscle relaxation technique using score of Epworth Sleepiness scale in order to identify the improvements in muscle insomnia.

However, insomnia is a sleep disorder that is characterized by difficulty falling and/or staying asleep. People with insomnia have one or more of the following symptoms: Difficulty falling asleep, waking up often during the night and having trouble going back to sleep and waking up too early in the morning.

Significance of mean difference of score on Epworth Sleepiness scale of young population was carried out between baseline and post intervention stages and that analyzed statistically.

The table 1 summarizes the assessment and comparison of the sleep disorder using score of Epworth Sleepiness scale of young population..

TABLE - 1
COMPARISION OF SLEEP DISORDER BETWEEN BASELINE AND POST INTERVENTION STAGES

Parameter	Sampling Stage & Difference	Scatter (point)	Z-statistic	p-value (LOS)
		Mean \pm SD		
Epworth Sleepiness Scale score	<i>Baseline</i>	11.07 \pm 5.04	19.65	p<0.001 [#]
	<i>Post Intervention</i>	5.33 \pm 3.18		
	<i>Mean Difference</i>	5.74point		

[#] The mean differences are highly significant at the 0.001 level of significance. The degrees of freedom are 53. [SD-Standard Deviation; Mean Diff-Mean Difference; LOS-Level of Significance]

Comparison in score measured on Epworth Sleepiness scale among young population was carried out between baseline (before) and post (after) intervention stages to judge the sleep disorder in young population which can be easily summarizes in table 1.

Score of Epworth Sleepiness scale found to be significantly differed and improved at post-intervention stage after intervention of progressive muscle relaxation technique as compared to baseline (pre-intervention) stage.

Young population had experienced significantly differed and improved sleep disorder after intervention of progressive muscle relaxation technique than pre-intervention stage.

Nevertheless, outcome of treatment indicated the effectiveness of progressive muscle relaxation technique among young population suffered from insomnia.

After intervention of PMRT among young insomniacs .the average (Mean ± Standard Deviation) score on ESS (5.33±3.18 points) found to be significantly reduced at large among young insomniacs at post intervention stage as compared to average score on ESS(11.07±5.04points) at baseline sampling stage. However, these mean difference of 5.74 points in score on ESS between baseline and post intervention among young population having insomnia were statistically strongly significant (p<0.001). Moreover, the statistical agreement projected that the young population intervened with PMRT had improved insomnia.

Henceforth, PMRT among young population may be preferred as an effective conservative program for improving insomnia in young population. Furthermore, PMRT may consider as a tool to combat insomnia.

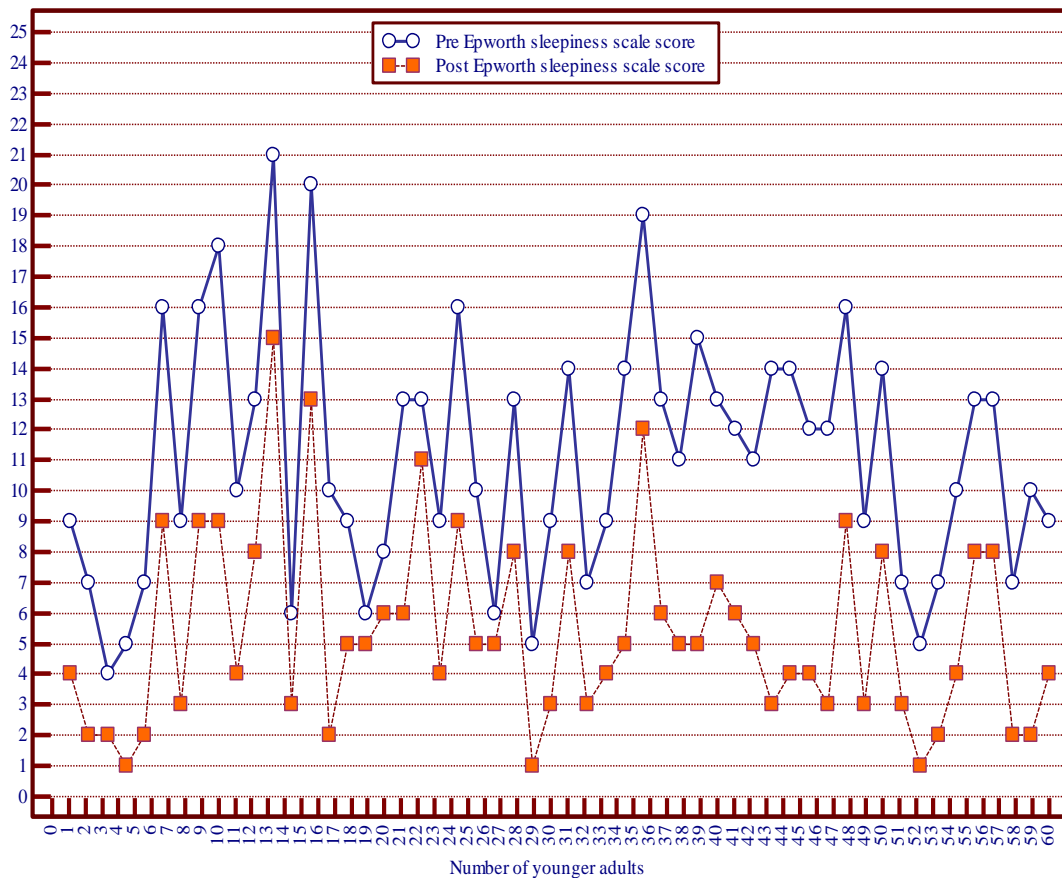


Figure - Line diagram showing the assessment and comparison of score of Epworth Sleepiness scale between baseline and post intervention stages.

RESULTS

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DISCUSSION

The purpose of the present study is to analyze the effectiveness of PMRT in young population having insomnia. There is one group pre test-post test research design, that is PMRT. The total number of participants is 54. The assessment is done by using the ESS scale. In this study one group pre test-post test shown improvements in ESS variable. In these study there is significant statistical difference in ESS scale.

After intervention of PMRT in students with insomnia, the average (Mean \pm standard deviation) ESS score (5.33 ± 3.18) found to be significantly reduced in young population at post intervention stage as compare to baseline sampling stage.

After 12 weeks of treatment ESS scale demonstrated significant improvement when compared to pre-test values. By the data analysis and results we found that- There was a significant effect of PMRT for insomnia among young population.

Limitation and recommendation

- Larger sample size may reveal the results to be more statistically viable.
- Further studies can be done with relative long intervention period (more than 12 weeks).
- Future studies can also be done on the other age groups which are prone to develop the insomnia: patients suffered from any pathological condition like psychological disorders.
- Specific age group can be selected for further studies.
- Specific gender group can be selected for further studies.

CONCLUSION-

After intervention of PMR (Progressive Muscle Relaxation) at post-intervention sampling stage, the stress level, sleep quality and sleep duration, in intervention group were significantly differed and improved when compared to pre-intervention sampling stage one. The outcome showed that the PMR (Progressive Muscle Relaxation) found to be more effective to reduce stress level, improve sleep quality and experienced more relaxation in body to do the daily routine work with proper attention and concentration. However, the PMR intervention may consider as an effective tool to treat the severity of insomnia, stress level, sleep duration, and sleep quality in young population having insomnia Aim of the proposed research titled “Efficacy testing of Progressive Muscle Relaxation for Insomnia in young population”. Present study concluded that there was highly significant effect of PMRT for insomnia in young population.

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