



Added Effects of Meditation on Physical Manifestations of Anxiety: Randomized Control Trial

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Abstract

Objective: The purpose of this study was to compare the additive effects of chanting Hare Krishna Mahamantra along with conventional treatment versus conventional treatment alone on Zung Self Rating Anxiety Scale, Clinical Anger Scale, Pittsburgh Sleep Quality Index, Fatigue Severity Scale and Numerical Pain Rating Scale in college going students.

Materials and methods: This experimental study was carried out in December 2023, involving students of different fields. 50 Participants full filling the inclusion criteria were chosen for research. Subjects were then allocated into two groups randomly Group A (Jacobson's progressive muscle relaxation) and B (Mantra Meditation along with Jacobson's progressive muscle relaxation) respectively with 25 participants in each group who were blinded. Participants in each group were assessed for anxiety and physical manifestations due to anxiety before and after treatment using Zung Self Rating Anxiety Scale, Pittsburgh Sleep Quality Index, Clinical Anger Scale, Fatigue Severity Scale, Numerical Pain Rating Scale.

Results: The experimental group showed significant reduction in anxiety level, anger, fatigue and pain ($p < 0.05$) on Zung Self Rating Anxiety Scale, Clinical Anger Scale, Fatigue Severity Scale, Numerical Pain Rating Scale. Whereas, the quality of sleep was not improved statistically ($p > 0.05$) on Pittsburgh Sleep Quality Index.

Conclusion: The study concludes that combining Mantra Meditation with Jacobson's progressive muscle relaxation has a significant impact on lowering anxiety and physical manifestations of anxiety (anger, fatigue, and pain) whereas the sleep quality was not improved in contrast to Jacobson's progressive muscle relaxation alone.

Keywords: Mantra Meditation, Jacobson's progressive muscle relaxation, anxiety and physical manifestations of anxiety, college students

Introduction

Anxiety is thought to be an axial stress reaction to emergency circumstances^[1]. Anxiety disproportionately impacts college students.^[2] 6.14% of those attending college reported potentially concerning levels of anxiety^[3]. A significant number of students feel anxious when they perceive challenges in meeting their academic or extracurricular goals.^[2] Long-term effects of anxiety can result in skeletal muscle tension that is habitual and permanent, which can lead to the development of anxiety-related pain syndromes^[1]. Research has indicated that individuals experiencing anxiety are more likely to experience musculoskeletal pain, and vice versa^[4]. There may be a biological vulnerability between anger and anxiety that causes people to react either way—that is, to "fight" or "flight"—when faced with crisis^[5]. There is some evidence that suggests people with anxiety disorders experience elevated levels of anger^[5]. Apart from disrupted sleep patterns and daytime drowsiness among students, anxiety is also associated with insomnia.^[6]

The following factors are contributed to students' increased anxiety in universities are as studying a new language, the curriculum's difficulty, exam difficulty, financial stress, illness, and family obligations^[2].

According to its definition, meditation involves cognitive training aimed at improving self-regulation of emotions and attention.^[7] One of the easiest and most powerful forms of meditation that can be used by both inexperienced and experienced practitioners is mantra meditation (MM)^[8]. Chanting Hare Krishna Mantra (HKM) appears to have positive effects on the EEG signal, supporting the human brain^[9]. Increase in alpha band power and decreases in beta band power in EEG oscillations are likely signs of lowered stress and anxiety levels as well as a calming and peaceful mental state^[9]. This provides an overview of research on the benefits of HKM meditation for mental health^[9]. Research has previously examined the potential of Mahamantra chanting to reduce female nurses' stress^[10]. The Mahamantra selected for chanting in this study is "Hare Krishna Hare Krishna, Krishna Krishna Hare Hare Hare Rama Hare Rama, Rama Rama Hare Hare." Research on the potential benefits of Mahamantra chanting for reducing anxiety and its effects on bodily manifestations are extremely limited^[10]. Thus, there is need to document additive effect of Hare Krishna Mahamantra with conventional

treatment (Jacobson's progressive relaxation) in reducing anxiety and physical manifestations due to anxiety so college students can get maximum benefit from it as a nonpharmacological regimen.

The study's objective was to compare the additive effect of chanting Hare Krishna Mahamantra along with conventional treatment versus conventional treatment alone on Self Rating Anxiety Scale, Clinical Anger Scale, Pittsburgh Sleep Quality Index, Fatigue Severity Scale and Numerical Pain Rating Scale in college going students.

Material and Method

Study design

This experimental study was conducted in Dr. D. Y. Patil College of Physiotherapy, Pune. The study's target population consisted of college-bound students, aged 18 to 25 years, who had anxiety levels between mild and moderate score of 24 on the Zung Self Rating Anxiety Scale. Following consent acquisition and institutional ethics committee approval (DYPCPT/ISEC/62/2023) from participants, the study commenced. Purposive sampling was employed, and 50 out of 50 students consented and were included. The subjects were blinded and randomly allocated in two groups with 25 subjects in each group using chit method. Group A was given Conventional treatment in the form of JPMRT and Group B was given JPMRT along with chanting of HKM.

Study material:

Zung Self Rating Anxiety Scale: Reliability: 0.73, Validity: 0.90

Clinical Anger Scale: Reliability: 0.83- 0.90, Validity: 0.85

Pittsburgh Sleep Quality Index: Reliability:>0.90, Validity: 0.70- 0.85

Fatigue Severity Scale: Reliability: 0.81-0.95, Validity: 0.90

Numerical Pain Rating Scale: Reliability: 0.79-0.96, Validity: 0.86-0.95



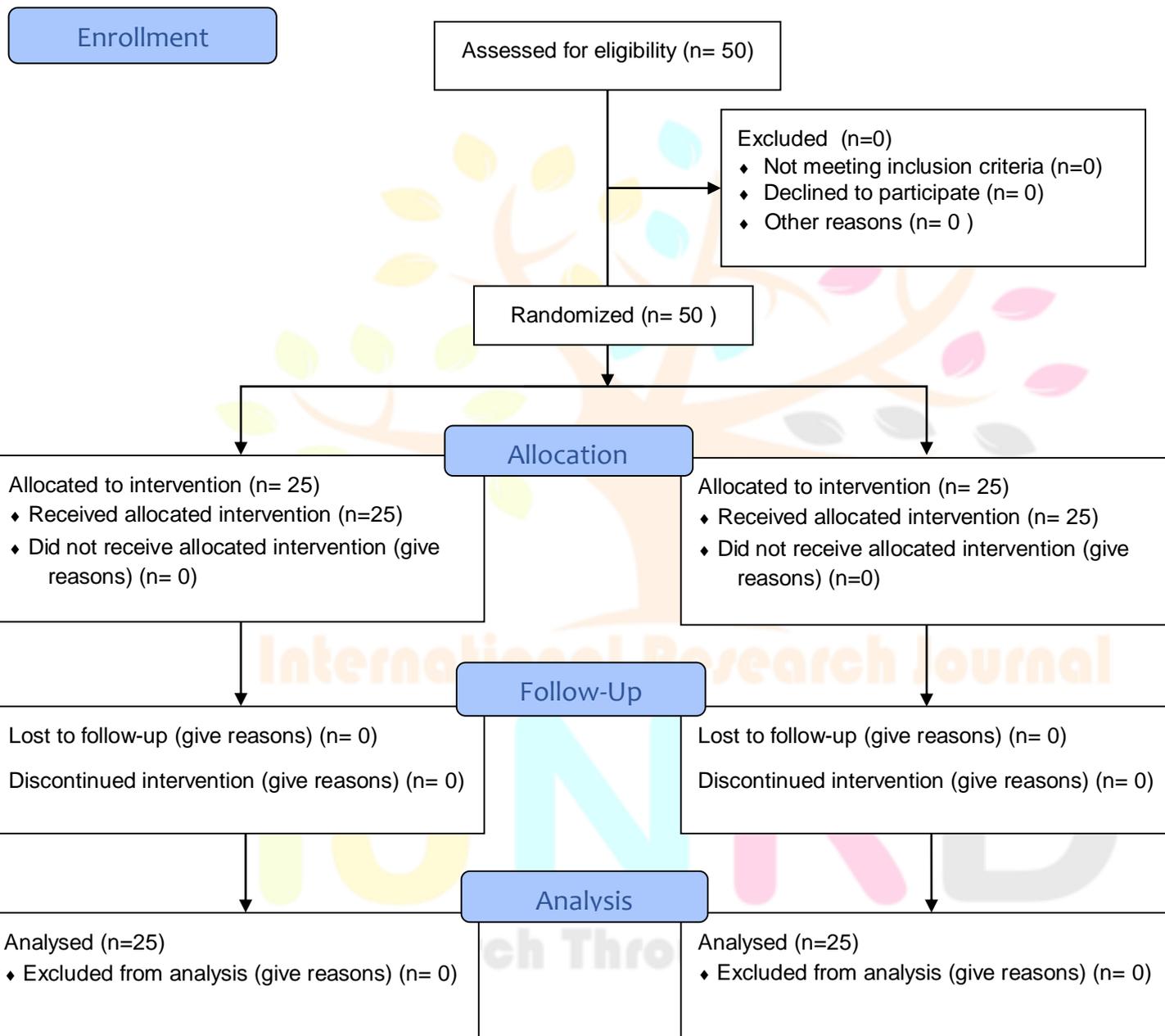
Procedure:



CONSORT

TRANSPARENT REPORTING of TRIALS

CONSORT 2010 Flow Diagram



Jacobson’s progressive muscle relaxation technique: During the exercise, particular muscle groups were tensed and relaxed.

Duration: Twenty minutes for Twenty-one days.

Position: Sitting upright.

Hare Krishna Mahamantra:

Duration: Chanting will take place for 20 minutes at a convenient time each day. ^[10]

Repetition: 108 times ^[10]

Position: The best way to chant is to sit in the Padmasana position or Vajrasana or Cross sitting with your back straight. The eyes should be closed, and the head should be upright without bowing or rising.

Instruction to Participants: Put all other thoughts aside, concentrate only on the words being chanted, and take deep breaths as they are being recited ^[10].

Mantra:

Hare Krishna Hare Krishna Krishna Krishna Hare Hare

Hare Ram Hare Ram Ram Ram Hare Hare



Figure 1. Participants Performing Jacobson’s Progressive Muscle Relaxation Technique



Figure 2. Participants Performing Mantra Meditation

Sample size calculation

Based on the research conducted by Tanvi Deepak Shah et.al. (2021) which stated that prevalence of anxiety in college going students are 6.14%. Taking its prevalence at 95% confidence interval and taking 07% absolute error. Sample size will be 46 that is 50 by WinPepi software.

Study materials

The study was carried out at the Community Based Rehabilitation Department. The outcome measures used to assess manifestations due to anxiety were Zung Self Rating Anxiety Scale, Pittsburgh Sleep Quality Index, Clinical Anger Scale, Fatigue Severity Scale, Numerical Pain Rating Scale. Chanting Beads were used for chanting Mahamantra.

Data analysis

Scoring of post assessment answers were documented using the Zung Self Rating Anxiety Scale, Pittsburgh Sleep Quality Index, Clinical Anger Scale, Fatigue Severity Scale, Numerical Pain Rating Scale.

Statistical analysis

Data entry and analysis were carried out utilizing the Statistical Package for Social Sciences (SPSS) software. Unpaired t-test was used for between group analysis. Statistical significance level was accepted as $p < 0.05$.

Results

Participant demographics and study flow

Out of 50 students, 40 (80%) comprised of females and 10 (20%) comprised of men, whose age ranged from 18 to 25 years.

Assessment outcomes

Students from both groups underwent assessments using outcome measures. The measures of the post-treatment assessment scores are depicted in table 1

Table 1: Between Group Analysis: Group A and Group B - Effect on Anxiety, Anger, Sleep, Fatigue, and Pain.

GROUP A and GROUP B		Mean	Mean Difference	Std. Deviation	Std. Error Mean	t-value	p-value
ZSRAS	GROUP A	32.56	8.52	3.852	0.770	10.26	<0.001
	GROUP B	24.04		1.541	0.308		
CAS	GROUP A	7.05	4.69	4.378	1.004	3.39	0.002
	GROUP B	2.36		1.629	0.491		
PSQI	GROUP A	4.15	0.62	1.927	0.431	1.01	0.317
	GROUP B	3.53		1.552	0.401		
FSS	GROUP A	20.63	10.19	8.795	2.018	3.41	0.002
	GROUP B	10.44		1.667	0.556		
NPRS	GROUP A	4.20	3.01	1.568	0.405	5.69	<0.001
	GROUP B	1.19		1.377	0.344		

For the between-group analysis, an unpaired t test was employed where Group B was significantly more effective than Group A in reducing anxiety, anger, fatigue, and pain where $p < 0.05$, but quality of sleep remained statistically insignificant as $p > 0.05$.

DISCUSSION

This study aimed to determine whether Mantra Meditation in addition to Jacobson's progressive muscle relaxation technique was more efficient in lowering anxiety, reducing anger, improving quality of sleep, reducing fatigue and pain than Jacobson's progressive muscle relaxation technique alone.

The results of this study demonstrated that the experimental group (Group B) was significantly more effective than control group (Group A) in reducing anxiety, anger, fatigue, and pain. But quality of sleep remained statistically insignificant. If we combine Jacobson's Progressive Muscle relaxation with Hare Krishna Mantra Meditation, it will yield greater outcomes. as Jacobson's progressive muscle relaxation approach requires fewer muscular tension than relaxation and have a soothing effect by diverting attention and promoting muscle relaxation ^[11].

Jacobson's progressive muscle relaxation technique reduced levels of anxiety, sleep disturbances, anger, fatigue, and pain. The study supporting these results was done by Dominika Wilczyńska et.al. (2019) stated that after Jacobson's relaxation, participants' average anxiety level fell ^[11]. The study was done by Syafa'atun Mirzanah et.al. (2020) stated that Jacobson's progressive muscle relaxation technique involves fewer muscle tension than relaxation ^[11]. Progressive muscular relaxation may provide a relaxing effect by diverting attention and causing a feeling of both muscular relaxation and overall tension ^[11]. It also causes profound relaxation by lowering electrical activity in the inferior frontal gyrus (IFG), superior frontal gyrus (SFG), and posterior cingulate cortex (PCC) ^[11]. Reduction in anxiety leads to improvement in quality of sleep. The findings of our study further affirm the conclusions drawn by Melissa Conrad Stöppler, MD (2022), regarding progressive muscle relaxation (PMR). PMR is a profound relaxation method known for its efficacy in managing stress and anxiety, alleviating insomnia, and mitigating symptoms of specific chronic pain conditions ^[12]. The study was done

by Vita Lucya et.al. (2019) stated that Progressive muscle relaxation therapy on a client at risk of aggressive behaviour is one of the management approaches for controlling anger^[13]. Stretching muscles and recognizing tension can assist clients minimize anxiety and tension when dealing with challenges, promoting adaptive coping skills^[12]. The study was done by Seyedeh Azam Sajadi et.al. (2024) stated that the Relaxation promotes the release of hormones and chemicals, leading to bodily changes such as enhanced blood flow in the hands and feet and reduced fatigue^[14]. The study was done by Elham Amini et.al. (2016) stated that the PMR exercise regimen may enhance physical function and minimize fatigue among cancer patients undergoing surgery^[15]. The current study also demonstrated the JPMRT program's positive effects on lowering fatigue in haemodialysis patients^[15]. The study was done by Heba Abdel-Fatah Ibrahim et.al. (2021) stated that the reduction in mean pain levels in the intervention group supports the study hypothesis that patients who use JPMRT technique have less postoperative pain compared to those who do not^[16]. This technique aims to reduce stress and pain by relaxing major muscle groups on a regular basis^[16].

Mantra Meditation reduced levels of anxiety, sleep disturbances, anger, fatigue, and pain. A study supporting this result was conducted by Lavanya Sekar et.al. (2019) stated that among moderately to severely stressed nursing professional women, chanting the Mahamantra, which is regarded as one type of bhakti yoga, has been shown to have a positive impact on anxiety relief^[10]. This effect is demonstrated by increased parasympathetic tone, improved cognitive function, and lowered levels of the stress hormone (serum cortisol)^[10]. The study was done by Kritiprasanna Das et.al. (2022) stated that chanting HKM appears to have positive impacts on the EEG signal, supporting the human brain^[9]. Changes in EEG oscillations, such as a reduction in beta band power and an increase in alpha band power, are likely signs of a reduction in tension and anxiety as well as a calming and peaceful mental state^[9]. The study was done by Metri K et.al. (2020) stated that Participants generally indicated that their sleep patterns had changed from being disturbed, snoring, insufficient, and difficult to fall asleep to being sound, adequate, and falling asleep quickly^[16]. Calm is brought to the mind by the vibration of the AUM sound^[17]. Even just hearing the chanting has a powerful effect^[16]. The study was done by Julie Lynch et.al. (2018) stated that the studies generally reveal good results for self-reported anger^[18]. A randomized controlled trial found that Transcendental Meditation significantly improved anger scores compared to the control group^[18]. A cross-sectional study found that non-Transcendental Meditation practitioners had double the level of anger as those who practiced Transcendental Meditation^[18]. The study was done by Mallavva Bajappanavar et.al. (2022) stated that the overall level of fatigue in the Omkar Chanting Group (OCG) has significantly decreased from the between the pre- and post-tests^[19]. The current study verified that there was a decline in overall fatigue^[18]. The study was done by Kim E. Innes et.al. (2018) stated that this study found that the Mantra Meditation group noticed higher decreases in fear of movement compared to the Music Listening group, which was substantially associated with improved pain and function^[20]. The study was done by Soumita Basu (2023) stated that Regular mantra meditation can boost the release of endorphins, which are the body's natural analgesics^[21]. This could help people manage chronic pain and discomfort more effectively^[21].

CONCLUSION

The study demonstrates that the integration of Mantra Meditation with Jacobson's progressive muscle relaxation leads to substantial reductions in anxiety, anger, fatigue, and pain. Additionally, there was a moderate improvement in sleep quality observed as well. The limitations of the study were that the study's sample size was small; larger participant numbers in subsequent research may help to strengthen the evidence for the intervention's efficacy. Although mantra chanting and Jacobson's progressive muscle relaxation intervention were administered for a minimum of 21 days in this study, more research is needed to determine the long-term benefits of these interventions.

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Abbreviations:

MM: Mantra Meditation

HKM: Hare Krishna Mantra

ZSRAS: Zung Self Rating Anxiety Scale

CAS: Clinical Anger Scale

PSQI: Pittsburgh Sleep Quality Index

FSS: Fatigue Severity Scale

NPRS: Numerical Pain Rating Scale

JPMRT: Jacobson's Progressive Muscle Relaxation Technique

