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EFFECT OF PROGRESSIVE MUSCLE RELAXATION VERSUS AUTOGENIC RELAXATION ON ANXIETY AMONG PHYSIOTHERAPY STUDENTS: A COMPARATIVE STUDY

Physiotherapy

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ABSTRACT

Background: Physiotherapy education is demanding and students face various stressors that affect their psychological wellbeing and academic performance. Anxiety is a prevalent concern among health profession students, yet limited research exists on anxiety management interventions in physiotherapy students. **Objectives:** To compare the effectiveness of Progressive Muscle Relaxation (PMR) and Autogenic Relaxation (AR) on anxiety among physiotherapy students. **Methods:** This pre-post comparative study included 60 physiotherapy students (aged 17-25 years) with mild to moderate anxiety, divided into two groups of 30 each. Group A received PMR and Group B received AR respectively, both for 15 minutes, three days per week for four weeks. Outcome measures included pulse rate, blood pressure (systolic and diastolic), and Manifest Anxiety Scale (MAS) scores, assessed at baseline and at the end of four weeks. **Results:** Both groups showed significant improvements in diastolic blood pressure ($p<0.05$). Group A demonstrated significant improvements in pulse rate ($p=0.031$), systolic blood pressure ($p=0.044$), and MAS scores ($p<0.001$). Group B showed significant improvement only in MAS scores ($p=0.018$). Between-group comparison revealed that PMR was significantly more effective than AR in reducing anxiety levels ($p<0.001$), with average improvements in MAS of 5.53 versus 1.63 points respectively. **Conclusion:** Both PMR and AR effectively reduces anxiety in physiotherapy students, but PMR demonstrates superior efficacy. These relaxation techniques should be incorporated into physiotherapy curricula to support student mental health and wellbeing.

KEYWORDS

Anxiety; Autogenic Relaxation; Physiotherapy Students; Progressive Muscle Relaxation; Stress Management

INTRODUCTION

Health professional education presents complex learning environments that are highly demanding and challenging for students. The stress and psychological morbidity associated with healthcare education can negatively impact emotional wellbeing and academic performance [1]. While considerable research has investigated stress in medical, dental, and nursing students, limited studies have examined physiotherapy students specifically [2-6].

Physiotherapy education is evolving, with educators increasingly concerned about psychological problems in students. Students face multiple stressors including academic demands, competition for grades, social adjustments, interpersonal and family problems, uncertainty about the future, high- stimulation college environments, examinations, excessive workload, and financial concerns [7-9]. These stressors not only affect academic performance but also threaten physical and psychological wellbeing.

The American Psychological Association defines anxiety as an emotion characterised by feelings of tension, worried thoughts, and physical changes such as increased blood pressure [10]. According to a survey conducted by the Association for University and College Counselling, anxiety was the top concern among college students (41.6%), followed by depression (36.4%) and relationship problems (35.8%) [11]. Approximately 24.5% of students were taking psychotropic medication, with 21% presenting severe mental health concerns and 40% presenting mild mental health concerns.

Anxiety disorders significantly impact students learning capacity, causing passive attitudes toward studies, lack of interest in learning, poor examination performance, and inadequate assignment completion [12]. The prevalence of anxiety among college students necessitates effective intervention strategies.

Progressive Muscle Relaxation (PMR), developed by Edmund Jacobson in the early 1920s, is a systematic technique for managing stress and achieving deep relaxation [13]. It involves deliberately tensing and releasing specific muscle groups to reduce muscular tension and associated stress symptoms. Autogenic Relaxation (AR), developed by German psychiatrist Johannes Heinrich Schultz and published in 1932, uses visual imagery and body awareness combined with self-suggestions of heaviness, warmth, and autonomic regulation to induce relaxation [14].Despite extensive research on these relaxation techniques in various populations, comparative studies in physiotherapy students remain scarce. This study aims to address this gap by comparing the effectiveness of PMR and AR on anxiety levels among physiotherapy students.

MATERIALS AND METHODS

Study Design And Setting

This pre-post comparative study was conducted at Nitte Institute of Physiotherapy, Deralakatte, Mangalore, following approval from the Institutional Human Ethics Committee.

Participants

Using purposive sampling, 60 physiotherapy students aged 17-25 years with Manifest Anxiety Scale scores <16 (indicating mild to moderate anxiety) were recruited. Students with severe anxiety (MAS score >16) or those unwilling to provide consent were excluded.

Intervention Protocol

Participants were divided into two groups of 30 students each:

Group A – Progressive Muscle Relaxation: Students lay comfortably on mats with eyes closed and received instruction on systematically tensing specific muscle groups for 5 seconds followed by releasing for 10 seconds. The sequence progressed through right and left hands and forearms, forehead, eyes, mouth, neck, shoulders, chest (deep breathing), buttocks, right and left thighs, calves, and toes.

Group B – Autogenic Relaxation: Students lay in supine position in a quiet, dimly lit room with comfortable temperature and clothing. They received guided instructions focusing on relaxation through self-suggestions of heaviness and warmth, beginning with legs and feet, progressing through back, chest, stomach, hands, arms, shoulders, neck, and face, with emphasis on breathing awareness and progressive bodily relaxation.Both interventions lasted 15 minutes per session, three days per week for four weeks.

Outcome Measures

The following parameters were assessed at baseline and after four weeks:

1. **Pulse Rate:** Measured at the radial artery using palpation for 60 seconds (normal range: 50-80 bpm)
2. **Blood Pressure:** Measured using a digital blood pressure monitor on the upper arm with the participant seated comfortably (normal range: 120/80 mmHg)
3. **Manifest Anxiety Scale (MAS):** A 38-item questionnaire with true/false responses assessing anxiety levels, with scores categorized as low, intermediate, or high anxiety

Statistical Analysis

Data was analysed using SPSS version 16.0. Descriptive statistics (frequency, percentage, mean, standard deviation) summarized participant characteristics. Paired t-tests compared pre-post changes

within groups, while independent t-tests compared between-group differences. Statistical significance was set at p<0.05.

RESULTS

Participant Characteristics

The study included 60 physiotherapy students with a mean age distribution across both groups (Table 1). Group A comprised 22 males and 8 females, while Group B included 16 males and 14 females. The majority of participants in Group A were 19 years old, while most in Group B were 20 years old.

Table 1: Demographic Characteristics and Baseline Measures

Variable	Group A (PMR)	Group B (AR)	Total
Age Distribution (years)			
18	2	0	2
19	12	7	19
20	7	11	18
21	2	4	6
22	4	6	10
23	3	2	5
Gender			
Male	22 (73.3%)	16 (53.3%)	38 (63.3%)
Female	8 (26.7%)	14 (46.7%)	22 (36.7%)
Total	**30**	**30**	**60**

Within-Group Comparisons

Table 2: Pre-Post Comparison Of Outcome Measures Within Groups

Outcome Measure	Group	Pre-intervention Mean±SD	Post-intervention Mean±SD	Mean Difference	t-value	p-value
Pulse Rate (bpm)	Group A	76.60±11.57	73.70±6.90	2.90	2.266	0.031*
	Group B	77.23±10.31	77.00±7.28	0.23	0.253	0.802
Systolic BP (mmHg)	Group A	125.37±12.01	122.07±5.00	3.30	2.104	0.044*
	Group B	119.50±13.34	120.37±6.68	-0.87	0.480	0.635
Diastolic BP (mmHg)	Group A	74.13±6.93	77.47±4.48	-3.33	3.025	0.005*
	Group B	71.27±10.31	76.40±4.86	-5.13	3.071	0.005*
MAS Score	Group A	14.93±5.38	9.40±2.63	5.53	8.186	<0.001*
	Group B	15.67±6.44	14.03±4.77	1.63	2.501	0.018*

Statistically significant at p<0.05; BP: Blood Pressure; MAS: Manifest Anxiety Scale

Group A showed statistically significant improvements in pulse rate (p=0.031), systolic blood pressure (p=0.044), diastolic blood pressure (p=0.005), and MAS scores (p<0.001). Group B demonstrated significant improvements in diastolic blood pressure (p=0.005) and MAS scores (p=0.018), but not in pulse rate or systolic blood pressure.

Between-Group Comparison

Table 3: Between-Group Comparison Of Mean Improvements

Outcome Measure	Group A Mean Improvement	Group B Mean Improvement	t-value	p- value	Significance
Pulse Rate (bpm)	2.90	0.23	1.692	0.096	NS
Systolic BP (mmHg)	3.30	-0.87	1.742	0.087	NS
Diastolic BP (mmHg)	-3.33	-5.13	0.899	0.372	NS
MAS Score	5.53	1.63	4.150	<0.001*	S

*Statistically significant at p<0.05; NS: Not Significant; S: Significant; BP: Blood Pressure; MAS: Manifest Anxiety Scale

Between-group analysis revealed no significant differences in pulse rate (p=0.096), systolic blood pressure (p=0.087), or diastolic blood pressure (p=0.372). However, PMR showed significantly greater reduction in anxiety levels compared to AR, with MAS score improvements of 5.53 versus 1.63 points respectively (p<0.001).

DISCUSSION

This study compared the effectiveness of PMR and AR on anxiety among physiotherapy students over a four-week intervention period. Both techniques produced beneficial effects, though PMR demonstrated superior efficacy in reducing anxiety levels.

The findings revealed that most physiotherapy students experience intermediate levels of anxiety, which aligns with previous research on health profession students [15-17]. Before intervention, 53% of Group A students had high anxiety and 47% had intermediate anxiety, while Group B showed 47% high and 53% intermediate anxiety levels. Gender differences in stress perception were observed, with male students reporting higher stress levels, though this finding warrants further investigation.

The significant reduction in pulse rate and systolic blood pressure in the PMR group supports previous research. A study by Khanna et al. demonstrated that PMR training significantly reduced elevated pulse rates in stressed females [18]. Similarly, Nickel et al. reported significant decreases in systolic blood pressure among pregnant women with asthma following PMR intervention [19]. The present study results are consistent with these findings, showing that even a four-week PMR protocol can effectively reduce physiological markers of stress.

Both groups showed significant improvements in diastolic blood pressure, suggesting that both relaxation techniques influence autonomic nervous system activity. However, the lack of significant changes in pulse rate and systolic blood pressure in the AR group differs from some previous studies. This discrepancy may be attributed to the shorter intervention duration in our study compared to longer-term AR protocols typically employed [20].

The superior effectiveness of PMR over AR in reducing anxiety, as measured by MAS scores, aligns with findings by Conrad and Roth, who concluded that PMR had greater effects on muscle tension and associated symptoms than autogenic training [21]. This may be explained by PMR's direct focus on physical muscle tension, which is closely associated with anxiety manifestations in students.

The findings of current study contrast with a study conducted by Bhattacharjee, which reported dramatic anxiety reduction following AR intervention [22]. This discrepancy might be due to differences in intervention duration, session frequency, or participant characteristics. Additionally, Manzoni et al.'s systematic review found that, consistent efficacy for various relaxation techniques including both PMR and AR, suggesting that individual responses may vary [23].

The practical implications of current findings are significant for physiotherapy education. Given the high prevalence of anxiety among students and its potential impact on learning capacity and academic performance, incorporating relaxation techniques into the curriculum could provide valuable coping strategies. PMR, with its straightforward technique and demonstrated efficacy, appears particularly suitable for implementation.

Limitations

There are few limitations of current study. The relatively short intervention period (four weeks) may not capture long-term effects. The study utilised purposive sampling rather than randomisation, which may introduce selection bias. Additionally, the study did not assess potential confounding factors such as concurrent life stressors, sleep quality, or physical activity levels that might influence anxiety levels.

Future Directions

Future research should include randomised controlled trials with longer follow-up periods to assess sustained benefits. Comparative studies incorporating additional relaxation techniques and investigation of optimal intervention frequency and duration would be valuable. Research should also explore the neurophysiological mechanisms underlying the differential effects of these relaxation

techniques and examine their cost-effectiveness for institutional implementation.

CONCLUSION

The present comparative study concludes that both Progressive Muscle Relaxation (PMR) and Autogenic Relaxation (AR) are effective non-pharmacological interventions for reducing anxiety among physiotherapy students. Given the demanding academic workload, clinical responsibilities, and performance expectations inherent in physiotherapy education, the use of structured relaxation strategies plays a crucial role in promoting psychological resilience and emotional balance. While both techniques demonstrated significant anxiety-reducing effects, PMR showed superior efficacy when compared to AR. This enhanced effectiveness of PMR may be attributed to its systematic approach of alternating muscle contraction and relaxation, which facilitates greater somatic awareness and rapid stress reduction.

The findings highlight the importance of early identification and management of anxiety in health professional students to prevent long-term adverse effects on academic performance, clinical competence, and overall wellbeing. Incorporating evidence-based relaxation techniques such as PMR and AR into physiotherapy curricula, student wellness programs, or orientation modules could provide students with practical coping skills to manage stress effectively. Regular practice of these techniques may also foster self-regulation, improve concentration, and enhance quality of life. Future research with larger sample sizes and long-term follow-up is recommended to explore sustained benefits and optimize implementation strategies. Overall, PMR, in particular, emerges as a valuable and accessible tool for supporting mental health in physiotherapy education.

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Conflict Of Interest

The authors declare no conflict of interest.

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