Original Article

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Psychiatry/Mental Health Section

Impact of Jacobson's Progressive Muscle Relaxation on Stress Levels of Exam Going MBBS Students of a Medical College in South Gujarat, India

DEVASHISH PALKAR[1], SANJIBANI PANIGRAHI[2], POOJA SHATADAL[3], RITAMBHARA MEHTA[4]

ABSTRACT

Introduction: Academic examinations are a very stressful event for an Bachelor of Medicine and Bachelor of Surgery (MBBS) student. While many students learn to deal with it through the use of helpful or unhelpful coping skills, many still end up with considerable psychological morbidity in the form of anxiety and depression along with deterioration in overall health. Jacobson's Progressive Muscle Relaxation (JPMR) causes deep muscle relaxation.

Aim: To find out the prevalence of stress and exam anxiety in students of 1st year MBBS and to study the impact of JPMR.

Materials and Methods: It was a quasi-experimental, pretest and post-test interventional study conducted amongst the first year MBBS students studying at the Government Medical College Surat, Gujarat, India, during March to May 2019. Two months before their internal exams, 114 1st year MBBS students were recruited for the study. They were given a pretest proforma which comprised of socio-demographic profile, Perceived Stress Scale (PSS), Test Anxiety Scale (TAS) and General Health Questionnaire (GHQ) 28. They were asked to attend JPMR sessions over the following month in batches of 30 each and asked to practise JPMR for one month leading up to their exams. Total 43 students attended these sessions while 71 did not. After one month, all 114 students were again given a post-test proforma comprising of the same scales. Paired t-test was applied to compare the pretest and post-test scores to see the impact of JPMR.

Results: The mean age of participants was 19 years. The students who completed their schooling in Gujarati medium and those who reported to be staying at hostel experienced significantly more TAS scores at baseline evaluation as compared to their counterparts from English medium schools and those staying at home respectively. There was a statistically significant reduction in mean scores of PSS and TAS before and after practice of JPMR in the 43 students who attended and practiced JPMR (p-value=0.005 and p-value=0.002, respectively; p-value <0.05 was considered to be significant).

Conclusion: One month practice of JPMR was found to be effective in reduction of stress and exam anxiety.

Keywords: Exam anxiety, Medical students, Perceived stress, Psychological morbidity

INTRODUCTION

Stress is an adaptive response to noxious stimulus causing disturbance in normal functioning [1]. Academic examination stress is an inevitable feature of student's life where periodic exam acts as an acute stressor. Students with test anxiety feel worried in evaluative situations. Research relating test anxiety to academic performance has established that high levels of test anxiety are associated with lower levels of students' learning and performance. The causes of test anxiety are found to be related to cognitive activities, or 'self-talk', that the students with high test anxiety performed while preparing for important exams [2]. This self-talk is found to be focused on the perception of the 'high stakes' of exams; prior academic performance and how students perceived this to influence new exam taking; perceived time constraints for study; and academic comparison with peers.

During exams, students are exposed to the immediate stress of exam and also to the anxiety about the fear of failure or low score due to high level of competition [2]. Exam stress is quite predominant among medical students. Various studies have reported the prevalence of perceived stress ranging from 27-73% among medical students [3-5]. Test anxiety is a prevalent and debilitating condition. Researchers have estimated that 10 million students at pre college levels and 15% of college students experience test anxiety worldwide [6]. The primary detrimental consequence of test anxiety is that it decreases performance and leads to consistent misinterpretation of intelligence, aptitude and progress of test anxious student [7].

Progressive muscle relaxation is a technique developed by physician Edmund Jacobson in the 1920's [8]. According to Jacobson's theory, anxiety and stress lead to muscle tension which in turn increases feeling of anxiety. He proposed that when the body is in a relaxed state, there is little muscle tension which leads to decreased anxiety. In his own words, "when one's body is relaxed; one's mind cannot be in a state of angst" [8].

Jacobson's progressive relaxation technique involves contracting and relaxing the muscles to make one feel calmer and helps relieve the symptoms of stress. Although, the cause of the anxiety will not disappear, one will probably feel more capable to deal with it once the tension in the body is released [9]. Relaxation reduces pain or pain perception and tension, creates a pleasant mental state, reduces anticipatory anxiety in response to stress, increases parasympathetic activities, increases knowledge concerning muscle tension and autonomous stimuli, improves concentration, increases the feeling of control, improves the ability to block inner talk, energises and improves sleep, decreases the cardiac index, lowers blood pressure, warms or cools body parts, enhances performance of physical activities which improves quality of life of those who practice it [10].

A study conducted on 70 nursing students in India and 218 nursing students abroad have shown the effectiveness of JPMR in reducing anxiety and stress levels [11,12]. However studies about impact of JPMR on MBBS students are lacking which inspired us to take up this challenge. Students in all years of MBBS in India experience mild to moderate levels of stress which makes stress management

strategies like JPMR imperative [13]. Since, first year MBBS students are new to the setup, they can be trained in stress management and relaxation early. It can be useful to them in the later years of their medical education which is a stressful journey of one major exam after another.

With this in mind, it was aimed to study the impact of regular practice of JPMR on stress levels of exam going 1st year MBBS students of Medical college of South Gujarat. If found effective, it can be used to help young MBBS students cope better in future and avoid late and emergency interventions.

MATERIALS AND METHODS

It was a Quasi-experimental, pretest and post-test interventional study conducted amongst the first year MBBS students studying at the Government Medical College Surat, Gujarat, India, during March to May 2019. The approval for the same was sought from the Institutional Ethics Committee (Letter no- GMCS/STU/ETHICS/Approval/4775119, dated 15/2/2019).

Inclusion and Exclusion criteria: Out of 250 students of the 1st year MBBS batch of 2018-2019, 114 students gave the consent for participating in this study and filled up the pretest proforma. Those students who did not give consent were excluded from the study.

Scales Administered

The pretest proforma included General Health Questionnaire (GHQ) 28 [14], Perceived Stress Scale (PSS) [15], and Test Anxiety Scale (TAS) [16].

a). Perceived stress scale

The PSS comprises of 10 items measured on a five point Likert scale (0: never, 1: almost never 2: sometimes 3: fairly often 4: very often). The PSS construct demonstrates a two factor structure; the first being "general stressors" and the second being "the ability to cope". The PSS score is obtained by summing the scores of all the items, with reverse coding for items 4, 5, 7, and 8 as they are positively stated. The PSS score ranges from 0 to 40, with the 40 point score representing the highest perceived stress level. The PSS determines the degree of stress experienced by the participant however it is not a diagnostic scale for anxiety or stress related disorders [15].

b) General health questionnaire 28 item scale version

The GHQ is a screening device for identifying minor psychiatric disorders in the general population. It is a 28 item scaled version-assesses somatic symptoms, anxiety, insomnia, social dysfunction and severe depression. The GHQ-28 uses a 4-point scale indicating the following frequencies of experience: "not at all", "no more than usual", "rather more than usual" and "much more than usual". The minimum score can be 0, and the maximum is 84.

c). Test anxiety scale

Test anexiety scale has 35 True/False questions regarding common situations faced by students during an examination. The total number of "True" checks is their TAS. A score of 11 or below on TAS ranks in the low test anxiety range [16]. A score of 12 to 20 ranks in the medium range. Any score above 20 signifies high test anxiety [16].

The students were then grouped into batches of 30 students each as per their roll numbers. Two months before their internal exam, one batch at a time, they were called to seminar hall of Psychiatry Outpatient Department (OPD) in the evening and taught JPMR by way of live demonstration of the session using standard JPMR script [17]. Three such successive sessions lasting 45 minutes were given to the students. Total 43 out of 114 students voluntarily attended these sessions while 71 students chose not to attend. These 43 students were asked to practice this relaxation exercise for the remainder of the days at least once in a day, leading up to their internal exams.

One month after teaching JPMR, i.e., before one month of their internal exam, all 114 students who had filled the pretest proforma were asked to fill the corresponding post-test proforma comprising of the same scales. Those 43 students who attended and practised JPMR were considered as intervention group and rest 71 students were considered as control group.

STATISTICAL ANALYSIS

The data obtained was entered in Microsoft Excel and statistical analysis was done using Statistical Package for the Social Sciences (SPSS-14) software. Paired t-test was used to measure the significance between pretest and post-test mean scores of PSS, GHQ-28 and TAS.

RESULTS

The demographic parameters of the 114 participants who signed the consent form and filled the baseline proforma are as mentioned in [Table/Fig-1].The mean age of participants was 19 years.

Demographic parameter	N (%)
Gender	
Males	68 (59.6)
Females	46 (40.4)
Is getting into MBBS a personal choice?	
Yes	104 (91.2)
No	10 (8.8)
Medium of schooling till 12th standard?	
English	47 (41.2)
Gujarati	67 (58.8)
Type of family of the participant	
Nuclear	80 (70.2)
Joint	34 (29.8)
Domicile of the participant	
Urban	77 (67.5)
Rural	37 (32.5)
Current living accommodation of the participant	
Hostel	68 (59.6)
Home	46 (40.4)

[Table/Fig-1]: Demographic details.

The students who completed their schooling in Gujarati medium and those who reported to be staying at hostel experienced significantly more TAS scores at baseline evaluation as compared to their counterparts from English medium schools and those staying at home respectively [Table/Fig-2].

Variables		PSS		GHQ-28		TAS	
		Mean (SD)	Chi-square test (p-value)	Mean (SD)	p-value	Mean (SD)	Chi-square test (p-value)
Gender	Males	16.96 (6.78)	0.539	21.10 (12.25)	0.096	20.47 (4.31)	0.539
	Females	17.65 (4.30)		17.72 (07.40)		18.89 (4.43)	
Medium of studies	English	17.74 (7.91)	0.444	22.00 (12.73)	0.076	19.75 (4.56)	0.013**
	Gujarati	16.88 (3.96)		18.15 (08.67)		20.70 (2.40)	
Family	Nuclear	17.08 (5.56)	0.65	18.63 (09.75)	0.08	19.56 (4.43)	0.32
	Joint	17.62 (6.69)		22.35 (12.29)		20.47 (4.38)	
Domicile	Urban	17.12 (6.38)	0.768	19.61 (10.39)	0.788	18.56 (3.85)	0.001**
	Rural	17.47 (4.86)		20.19 (11.14)		22.44 (4.43)	
Current living	Hostel	17.37 (5.98)	0.77	20.06 (10.39)	0.65	20.51 (4.74)	0.04**
	Home	17.04 (5.83)		19.26 (11.14)		18.83 (3.70)	
MBBS taken by choice	Yes	17.26 (6.10)	0.89	20.12 (11.06)	0.22	19.75 (4.56)	0.52
	No	17.00 (3.23)		15.80 (02.48)		20.70 (2.40)	

[Table/Fig-2]: Association between demographic variables and baseline Perceived Stress Scale (PSS), General Health Questionnaire (GHQ-28) and Test Anxiety Scale (TAS). p-value <0.05 was considered as statistically significant; **signifies that the p value is statistically significant

Scales	Intervention group (43)		Independent t-test for equality of means (p-value)	Control group (71)		Independent t-test for equality of means (p-value)
	Baseline	Follow-up		Baseline	Follow-up	
	Mean±SD	Mean±SD		Mean±SD	Mean±SD	
Perceived stress scale	18.25±06.19	15.86±04.30	0.005**	17.54±04.72	18.31±04.52	0.493
General health questionnaire	20.27±11.48	17.11±08.12	0.063	19.40±10.19	20.49±09.96	0.674
Test anxiety scale	19.48±04.88	17.93±03.83	0.002**	20.04±04.12	20.35±04.07	0.519

[Table/Fig-3]: Comparison of baseline and follow-up data.
**signifies that the p-value is statistically significant; (p-value <0.05 was considered as statistically significant)

After one month of practising JPMR, 43 students of the intervention group experienced statistically significant reduction in both PSS and TAS (p-value=0.005 and p-value=0.002, respectively; p-value <0.05 was considered as statistically significant) than that recorded at baseline. There was no clinically significant difference in GHQ Scores. Also, there was no statistically clinically significant difference in the baseline and follow-up mean scores of the 71 students who did not practice JPMR [Table/Fig-3].

DISCUSSION

The JPMR Technique is often overlooked despite it being a viable treatment option especially in mild to moderate cases of stress and anxiety, where prescribing antidepressant medicines can lead to undesirable side effects [11,18]. When progressive muscle relaxation is practiced and incorporated into daily routine, it helps to alleviate negative emotional states and helps to better cope with the daily hassles of academic life [12]. The present study was aimed at finding whether JPMR had any impact on the stress and anxiety levels of the first year MBBS students who were due to appear for their exams. The results showed that JPMR was effective in reducing the test anxiety and PSS scores after regularly practising it for one month.

Many previous studies on students have yielded support to the beneficial role of JPMR in reducing stress and anxiety. The study conducted by Nair PP and Meera DK among secondary school students revealed that progressive muscle relaxation is an effective intervention in reducing the academic stress in the classroom situation [19]. A similar study evaluated the academic stress among the adolescents in selected schools of Mangaluru, Karnataka [20], wherein there was significant reduction of stress and anxiety in the intervention group which was taught JPMR. Also, these findings are in line with a study conducted on first year medical students studying in an urban tertiary general hospital at Mumbai [21] wherein there was significant reduction in stress levels in a group of students who were taught JPMR. In another study, nursing students reported decreased stress levels after 10 days of regular practise of JPMR [11]. JPMR was also found to be effective in reducing the social anxiety in a study on a group of high school students of Udupi district, Karnataka [22]. Study conducted by Zargarzadeh M and Shirazi M among nursing students of Isfahan University of Medical Sciences found that performing progressive muscle relaxation method was effective in reducing test anxiety among nursing students [23].

The uses of JPMR are not restricted to student population alone. It has also been found beneficial in diverse clinical population and myriad other conditions like reduction in the intensity of myofascial pain in patients of temporomandibular joint disorders as well as in minimising the anxiety and depression related symptoms in hospitalised patients of leprosy and also in patients of HIV [24-26].

In summary, JPMR is effective to reduce the impact of stress which is essential for the overall wellbeing of the person [12]. Also, it is easy to learn and practice, does not require trained professional or any equipment to facilitate the training [25]. It is therefore the need of the hour that educational institutions take necessary actions to include such relaxation exercises in the curriculum.

The current study for the first time offered MBBS students of the institute a chance to learn an important stress reduction technique of JPMR. There are very few studies of the use of JPMR in MBBS students in India which makes this study unique in itself.

Limitation(s)

The sample size was limited as the study was restricted to only one batch of MBBS students at one college. All the tools used in the study were self report screening instruments and cannot be used for diagnostic purpose.

CONCLUSION(S)

The results of the present study revealed the effect of one month practice of JPMR on reduction of perceived stress and test anxiety in first year MBBS exam going students. Programs at medical colleges need to address stress management and support needs of students which can reduce the perceived stress, test anxiety and improve academic performance. Future studies are needed in this regard.

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PARTICULARS OF CONTRIBUTORS:
1. Resident, Department of Psychiatry, Government Medical College, Surat, Gujarat, India.
2. Assistant Professor, Department of Psychiatry, Government Medical College, Surat, Gujarat, India.
3. Senior Resident, Department of Psychiatry, Government Medical College, Surat, Gujarat, India.
4. Professor and Head, Department of Psychiatry, Government Medical College, Surat, Gujarat, India.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:
Dr. Devashish Rajesh Palkar,
OPD-13, New Civil Hospital, Near Majuragate, Surat-395001, Gujarat, India.
E-mail: devashishpsychiatrist@gmail.com

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