

Original Research Article

## Effectiveness of Progressive Muscle Relaxation Techniques on Depression, Anxiety and Stress among Undergraduate Nursing Students

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### ABSTRACT

**Background:** Medical and nursing students repeatedly experience different stresses which render them more vulnerable to psychological problems that may affect their emotional, psychosocial and physical health. Medical school environment has been recognized as a stressful with negative effects on the academic performance, physical, and psychological well beings of the students. The aim of this study was to find out the prevalence of depression, anxiety and stress among nursing students and to determine the effect of progressive muscle relaxation technique on reducing depression, anxiety and stress among students.

**Methods:** Pre experimental one group pre-test post-test design was adopted to achieve the goal of the study. The data were collected from 218 undergraduate nursing students using demographic data, Depression Anxiety and Stress Scale (DASS 42). The progressive muscle relaxation technique was administered to nursing students identified with mild, moderate, severe and extremely severe negative emotional states.

**Results:** The finding of the study showed that, among 218 nursing students surveyed, the prevalence of Depression, Anxiety and stress found to be 75(34.4%), 119(54.6%) and 78(35.8%) respectively. Study results revealed that stress, anxiety and depression were significantly decreased among the study group after the intervention ( $p = .0001$ ).

**Conclusion:** The study concludes that, progressive muscle relaxation technique is very effective in reducing depression, anxiety and stress among nursing students. After intervention most of the participants felt relaxed and reduced the severity of negative emotional states and returned to the normal state of emotion. When progressive muscle relaxation is practiced and incorporated into student's daily routine, it would definitely help them to alleviate negative emotional states and better cope up with the daily hassles of academic life.

**Key words:** Effectiveness, Progressive muscle relaxation technique, depression, anxiety, stress, nursing students

### INTRODUCTION

Depression, anxiety and stress have a high detrimental effect to individual and society, which can lead to negative outcomes including medical dropouts, increased suicidal tendency, relationship and marital problems, impaired ability to work effectively, burnout and also existing problems of health care provision. There is a need for greater attention to the

psychological wellbeing of undergraduate students to improve their quality of life. <sup>[1]</sup>

Depression, anxiety and stress are highly prevalent among undergraduate nursing students. Moreover, there is a strong positive relationship between stress, anxiety and depression. These results might help to better understand the phenomenon of psychological well-being among nursing students in the selected setting. The

planning of effective interventions and policies are very important to limit the psychological health issues among nursing students. Early recognition of stress and related problems are essential, and initiation of stress management programs expanding counselling activities for nursing students are warranted. Providing adequate facilities and resources should be highly prioritized by authorities. [2]

Students' distress may influence professional development and adversely impact academic performance contributing to academic dishonesty and substance abuse, and may play a role in attrition from medical school. The study reports above 30% prevalence of depression, anxiety and stress among medical students. The need of the time is to make medical teachers and medical students aware of negative consequences of high levels of depression, anxiety and stress. [3]

In public medical universities, the prevalence of depression and anxiety ranged from 10.4% to 43.8% and 43.7% to 69% respectively. However, the prevalence of depression and anxiety among private medical students has been estimated to be 19% to 60% and 29.4% to 60% respectively. [4] In Hong Kong, a web-based survey of stress among the first-year tertiary education students found that 27% of the respondents were having stress with moderate severity or above. [5] While in India, a study was conducted to focus on the prevalence of current depression, anxiety, and stress-related symptoms among young adults, ranging from mild to extremely severe, which was 18.5%, 24.4%, and 20% respectively. Clinical depression was present in 12.1% and generalized anxiety disorder in 19.0%. Co-morbid anxiety and depression were high, with about 87% of those having depression also suffering from anxiety disorder. [6]

Depression is a common illness worldwide, with more than 300 million people affected. Depression is different from usual mood fluctuations and short-lived emotional responses to challenges in

everyday life. Especially when long-lasting and with moderate or severe intensity, depression may become a serious health condition. It can cause the affected person to suffer greatly and function poorly at work, at school and in the family. At its worst, depression can lead to suicide. Close to 800 000 people die due to suicide every year. Suicide is the second leading cause of death in 15-29-year-olds. The burden of depression and other mental health conditions is on the rise globally. [7]

Among the relaxation methods, progressive muscle relaxation technique is the easiest one to be learnt and administered. This intervention is inexpensive, available, self-induced and free from side effects. It is a systematic technique to reduce stress and attain a deep state of relaxation. [8,9] As early as 1930, Dr. Edmund Jacobson had developed the Progressive Muscle Relaxation Technique. He discovered that a muscle could be relaxed by first tensing it for a few seconds and then releasing it. Progressive muscle relaxation helps people identify which muscles or muscle groups are chronically tense by distinguishing between sensations of tension (purposeful muscle tensing) and relaxation (a conscious relaxing of the muscles). Each muscle or muscle grouping is tensed for 5-7 seconds and after that they relaxed for 20-30 seconds. During each time, the individual focuses on the difference in sensations between the two conditions. The awareness of the relaxing sensation is one of the greatest gains realized with progressive muscle relaxation. [10,11]

The aim of this study was to find out the prevalence of depression, anxiety and stress among nursing students and to determine the effectiveness of progressive muscle relaxation technique on reducing depression, anxiety and stress among students.

## **MATERIALS AND METHODS**

### **Study design and setting:**

Pre experimental one group pre-test post-test design was adopted to achieve the

goal of the study. The study population consisted of undergraduate nursing students from Nursing Department, College of Applied Medical Sciences (Campus for girls, Moahil) King Khalid University and included students from level one to level eight (first year to fourth year). In this study sample size was 218, and purposive sampling technique was used to select the samples.

#### **Instruments:**

*Section 1:* This part of the tool consisted of the background information of participants collected by using a demographic data sheet. Background data includes their age, marital status, study hours, duration of sleep hours, and quality of relationship between parents.

*Section 2:* This section includes a 42 item questionnaire, Depression Anxiety and Stress Scale (DASS) which includes three self-report scales designed to measure the negative emotional states of depression, anxiety and stress. This self-report scale was translated to an Arabic version to be used in this study. Each of the three scales contains 14 items, divided into subscales of 2-5 items with similar content. Participants were asked to use 4-point severity/frequency scale to rate the extent to which they had experienced each state over the past week. This scale is as follows: Did not apply to me at all = 0, applied to me to some degree, or some of the time = 1, Applied to me to a considerable degree, or a good part of time = 2, and Applied to me very much, or most of the time = 3. Scores for depression, anxiety and stress were calculated by summing the scores for the relevant items. The total score of depression was classified as follows: Score 0-9 is considered normal, 10-13 mild, 14-20 moderate, 21-27 severe, and higher than 28 is extremely severe. While the total score of anxiety was: 0-7 is normal, 8-9 mild, 10-14 moderate, 15-19 severe, and higher than 20 is extremely severe. In addition, the total score of stress was: Scores from 0-14 is normal, 15-18 mild, 19-25 moderate, 26-33 severe and higher than 34 is extremely severe. <sup>[12]</sup>

#### **Data collection procedure:**

After obtaining permission from ethical committee and authorities of Nursing Department, the researchers met the nursing students of first year to fourth year (Level one to level eight) as per the students' availability on each day. After explained the purpose of the study, obtained their written consent. Then the questionnaires were distributed to all students, presented on the day of data collection. Researchers took three days to complete the data collection from each class and finally obtained 218 completed questionnaires. Thereafter, the students with mild, moderate, severe and extremely severe negative emotional state were identified from DASS -42 rating scale. Among the 218 participants, 75 of them had depression, 119 students identified with anxiety and 78 participants had stress according to various severity levels of DASS -42 rating scale.

#### **Arrangement of participants for Progressive Muscle relaxation training:**

The participants identified with negative emotional states of depression, anxiety and stress were given progressive muscle relaxation technique from the very next day of data collection. The progressive muscle relaxation technique was administered to nursing students with mild, moderate, severe and extremely severe levels. Researchers arranged a convenient place at college to initiate progressive relaxation training and made a training schedule according to the availability of participants each day. Participants were divided into 4 groups each day for training and the researchers responsible for each group assigned the students equally to demonstrate the relaxation exercise. The intervention session was initiated on the basis of participants' availability and academic schedule each week. The relaxation session conducted for 5 weeks, that is during the first ten days the participants attended all the session continuously, and then they participated at least three sessions per week because of their clinical training schedule. Researchers

ensured that all participants attended relaxation training during the five weeks period. At the end of fifth week, post- test was given to all participants completed the whole session.

### **Administration of progressive muscle relaxation training for participants:**

Progressive Muscle Relaxation Exercise PMR can be practiced in a comfortable position sitting or lying down in a place that you will be undisturbed for 10-15 minutes. Focus your attention on each of the groups of muscles in the list below and work through them one muscle group at a time. Tense each muscle group and notice how that muscle feels when it is tensed. Hold this tension for five seconds while breathing in. Then, release and relax that muscle all at once. Pay close attention to the feeling of relaxation when releasing the contracted muscle. Practice tensing this same muscle group one or two more times but using less and less tension each time. This helps build awareness of tension in the body and improves the ability to differentiate between tension and relaxation in certain muscle groups. Experiment with saying the word "RELAX" each time you release a muscle group to deepen the feeling of relaxation in the mind and body.

Step 1: Assume a comfortable position. You may lie down or sit in a comfortable chair, loosen any tight clothing, close your eyes and be quiet.

Step 2: Assume a passive attitude. Focus on yourself and on achieving relaxation in specific body muscles. Tune out all other thoughts.

Step 3: Tense and relax each muscle group as follows:

- Forehead - Wrinkle your forehead; try to make your eyebrows touch your hairline for five seconds. Relax.
- Eyes and nose - Close your eyes as tightly as you can for five seconds. Relax.
- Lips, cheeks and jaw - Draw the centres of your mouth back and grimace for five

seconds. Relax. Feel the warmth and calmness in your face.

- Hands - Extend your arms in front of you. Clench your fists tightly for five seconds. Relax. Feel the warmth and calmness in your hands.
- Forearms - Extend your arms out against an invisible wall and push forward with your hands for five seconds. Relax.
- Upper arms - Bend your elbows. Tense your biceps for five seconds. Relax. Feel the tension leave your arms.
- Shoulders - Shrug your shoulders up to your ears for five seconds. Relax.
- Back - Arch your back off the floor for five seconds. Relax. Feel the anxiety and tension disappearing.
- Stomach - Tighten your stomach muscles for five seconds. Relax.
- Hips and buttocks - Tighten your hip and buttock muscles for five seconds. Relax.
- Thighs - Tighten your thigh muscles by pressing your legs together as tightly as you can for five seconds. Relax.
- Feet - Bend your ankles toward your body as far as you can for five seconds. Relax.
- Toes - Curl your toes as tightly as you can for five seconds. Relax.

Step 4: Focus on any muscles which may still be tense. If any muscle remains tense, tighten and relax those specific muscle three or four times

Step 5: Fix the feeling of relaxation in your mind. Resolve to repeat the process again. Remember, people respond differently to various activities. Some feel pleasant or refreshed, and others feel calm and relaxed after an activity like this one. Some people notice little change the first time, but with practice, their control increases - as well as the benefits. If you practice this activity, your relaxation should increase. After the tentative period the same stress questionnaires are used as a post test for the finding of the study

### **Data analysis:**

The collected data were tabulated and analysed using Statistical Package of

Social Science (SPSS), version 16. The results are inferred through statistical techniques like Descriptive and Inferential Statistical methods like Mean, standard deviation and paired t test. Paired t test was used to find out the significance difference between the mean pre-test and mean post test scores. We considered p value as significant when it is less than 0.01 level.

## RESULTS

**Table 1: Socio demographic characteristics of study participants (n=218)**

Items	Category	Number	Percentage
Age group (Years)	17-18	59	27.1
	19-20	94	43.1
	>20	65	29.8
Marital status	Unmarried	186	85.4
	Married	28	12.8
	Widow	4	1.8
Credit hours per week (Theory & Practical)	4-8	114	52.3
	9-13	54	24.8
	14-18	50	22.9
Hours of sleep in night	2-4	78	35.8
	5-7	98	45
	8-10	38	17.4
	>10	4	1.8
Quality of relationship between parents	Good	180	82.5
	Living separately	8	3.7
	Divorce	15	6.9
	Death	15	6.9

This study consisted of 218 undergraduate nursing students from Nursing Department, College of Applied Medical Sciences for girls, King Khalid University. Most of the participants (43.1%) between the age group of 19-20 years, and majority of them were unmarried (85.4%). Among the total of 218 students, around half of them (52.2%) had taken 4-8 hours as preferred credit for theory and practical subjects while almost similar level

maintained for 9-13 hours (24.8%) and 14-18 hours (22.9%) respectively. More than one quarter of participants (82.5%) felt that the quality of relationship of parents were good, while divorce and death contributed an equal distribution of (6.9%) (Table 1)

**Table 2: Prevalence of Depression, anxiety and stress among nursing students (n=218)**

Variables	Number (Percentage)
<i>Depression</i>	
Normal	143(65.6)
Mild	32(14.7)
Moderate	34(15.6)
Severe	6(2.7)
Extremely severe	3(1.4)
<i>Anxiety</i>	
Normal	99(45.4)
Mild	27(12.4)
Moderate	43(19.7)
Severe	29(13.3)
Extremely severe	20(9.2)
<i>Stress</i>	
Normal	140(64.2)
Mild	28(12.8)
Moderate	32(14.7)
Severe	15(6.9)
Extremely severe	3(1.4)

Table 2 represents the report on prevalence of depression, anxiety and stress among 218 students. Even though a good number of students had normal emotional states, most of the students' experienced negative emotional states of depression, anxiety and stress categorized as mild, moderate, severe and extremely severe levels. In comparison with the severity levels from mild to extremely severe emotional states, the participants mostly experienced moderate levels of negative emotion that is depression 15.6%, anxiety 19.7% and stress 14.7% respectively.

**Table 3: Comparison of depression scores before and after intervention (n=75)**

Levels of Depression with scores n=75(34.4%)	Before intervention		After intervention		T test (p)
	No	%	No	%	
Normal(0-9)	0	00.0	38	50.7	t = 19.7726 (.000)*
Mild (10-13)	32	42.7	27	36.0	
Moderate(14-20)	34	45.3	9	12.0	
Severe(21-27)	6	08.0	1	01.3	
Extremely severe(28+)	3	04.0	0	00.0	
Mean± Standard deviation	15.21± 4.58		9.29±4.81		

\*Significant at p<0.01level

Table 3 depicts the comparison of depression scores before and after progressive muscles relaxation training. Among 75 participants identified with

various levels of depression, majority of them had mild and moderate depression before intervention that is 43.7% and 45.3% respectively. Also among them 4% had



extremely severe depression. It is important to notice that after intervention extremely severe depression had completely disappeared and mild and moderate depressions among them were reduced to 27% and 9% respectively. The difference between the scores found statistically significant at  $p < 0.01$  level with a mean and standard deviation of  $15.21 \pm 4.58$  before intervention and  $9.29 \pm 4.81$  after intervention respectively. Progressive muscle relaxation training was found to be very effective in reducing depression severity levels as more than half of the participants 50.7% identified with normal state after this intervention.

**Table 4: Comparison of anxiety scores before and after intervention (n=119)**

Levels of anxiety with scores n=119(54.6%)	Before intervention		After intervention		T test (p)
	No	%	No	%	
Normal(0-7)	0	00.0	72	60.5	t = 35.5133 (.000)*
Mild (8-9)	27	22.7	32	26.9	
Moderate(10-14)	43	36.1	11	09.2	
Severe(15-19)	29	24.4	4	03.4	
Extremely severe(20+)	20	16.8	0	00.0	
Mean $\pm$ Standard deviation	13.98 $\pm$ 4.36		6.18 $\pm$ 3.77		

\*Significant at  $p < 0.01$  level

Table 4 shows the comparison of anxiety score before and after progressive muscle relaxation training. Among the total of 119 participants recognized as various levels of anxiety, before intervention majority of them had moderate anxiety about 36%, while most of them had mild and severe anxiety level of 22.7% and 24.4% respectively. In comparison with other emotional states like depression and stress, more participants (16.8%) identified with extreme level of anxiety before intervention. It is highly essential to mention that, after intervention the participants who found to be extreme anxiety level has completely disappeared, also moderate, severe anxiety level reduced to 9.2% and 3.4% respectively. The difference between anxiety scores before and after intervention found statistically significant at  $p < 0.01$  level with a mean and standard deviation of  $13.98 \pm 4.36$  before intervention and  $6.18 \pm 3.77$  after intervention respectively.

**Table 5: Comparison of stress scores before and after intervention (n=78)**

Levels of Stress with scores n=78(35.8%)	Before intervention		After intervention		T test (p)
	No	%	No	%	
Normal(0-14)	0	00.0	42	53.9	t = 29.4279 (.000)*
Mild (15-18)	28	35.9	24	30.8	
Moderate(19-25)	32	41.0	10	12.8	
Severe(26-33)	15	19.2	2	02.5	
Extremely severe(34)	3	03.9	0	00.0	
Mean $\pm$ Standard deviation	21.19 $\pm$ 5.14		13.72 $\pm$ 5.19		

\*Significant at  $p < 0.01$  level

Table 5 represents the comparison of stress scores before and after progression muscles relaxation training. Among 78 participants identified with various levels of stress, majority of them had moderate stress before intervention that is about 41%. Also among them 3.9% had extremely severe stress. In comparison with the scores of depression and anxiety, here also after intervention, extremely severe stress had completely disappeared and moderate stress among them were reduced to 12.8%. The difference between the scores found statistically significant at  $p < 0.01$  level with a mean and standard deviation of  $21.19 \pm 5.14$

before intervention and  $13.72 \pm 5.19$  after intervention respectively. Progressive muscle relaxation training was found to be very effective in reducing stress severity levels, as more than half of the participants, 53.9% identified with normal state after this intervention.

## DISCUSSION

The present study revealed that, negative emotional states of depression, anxiety and stress were highly prevalent among nursing students and importance of relaxation training to reduce such emotional hassles from students' daily lives. The

findings of the present study suggests the potential benefits of progressive muscle relaxation training in reducing negative emotional states of depression, anxiety and stress among undergraduate nursing students. When progressive muscle relaxation is practiced and incorporated into their daily routine, it definitely helps them to alleviate negative emotional states and better cope up with the daily hassles of academic life. The results obtained from our study showed that, among 218 nursing students surveyed, the prevalence of Depression, Anxiety and stress found to be 75(34.4%), 119(54.6%) and 78(35.8%) respectively, and most of the participants (43.1%) between the age group of 19-20 years.

The findings of the present study go in line with the study done among nursing students by Zarquarzadeh M, Shirazi (2014).<sup>[13]</sup> The result showed that performing progressive muscle relaxation method was effective in reducing test anxiety among nursing students. It is suggested to conduct educational programs concerning this method in the faculties of nursing to decrease the test anxiety of nursing students. The result showed in our study revealed that after progressive muscled relaxation training, the participants who found to be extreme anxiety level has completely disappeared, also moderate, severe anxiety level reduced to 9.2% and 3.4% respectively.

The outcome of the present study also supports the study conducted by Febu Elizabeth Joy, Tessy Treesa Jose & Asha K. Nayak (2014).<sup>[14]</sup> The results from their study suggest that Jacobson's Progressive Muscle Relaxation Technique is effective in reducing the social anxiety. There is a significant decrease in the perceived stress of students who had practiced JPMR. JPMR is effective in reducing perceived stress.<sup>[15]</sup> The findings from our study reports that Progressive muscle relaxation training was found to be very effective in reducing stress severity levels, as more than half of the

participants, 53.9% identified with normal state after this intervention.

The study conducted by Praseeda P. Nair, Dr. K. P. Meera (2014)<sup>[16]</sup> among secondary school students revealed that Progressive Muscle Relaxation is an effective intervention in reducing the Academic Stress in the classroom situation. As the reduced rate of Stress is essential for the well-being school should take necessary actions to include such relaxation exercises in school, as such techniques are useful for controlling their stress it is useful for them for their future also.

Also another study conducted for staff nurses by Palak Patel (2014)<sup>[17]</sup> revealed that in pre-test most of the nurses 53.3% had moderate stress, 40.0% had mild stress and 6.7% had severe stress. In post-test most of the nurses had mild stress 73.3 % and no stress 26.7%. The study concluded that Progressive Muscle Relaxation Therapy is effective in reducing the stress level of the staff nurses.

Prabhuswami Hiremath., et.al (2016)<sup>[18]</sup> concluded in their study that students who are newly taking admission to nursing profession will have mild form of psychological variation. It's the institutional teachers who has to focus on their psychological needs and if require students must be sent for consultation of psychiatrist after detailed counselling.

The result of the present study agrees with the outcome of study conducted by Eman N. Ramadan and Hanem A. A. Ahmed,(2015).<sup>[19]</sup> It is very important for nurse educator to help nursing students manage their stress and anxiety in order to prevent additional problems. The result of the study indicated that stress, anxiety, and depression increased in control group immediately and three months after program compared to before the program. This may result from extreme demands, time pressure, reduced motivation and poor coping among nursing students. The workload of the students increases with the study year. High stress level in the year 2 and 3 may be related with the introduction of clinical

practice, feeling of personal inadequacy and fear of making mistakes. Also depressive symptoms may be more common as a result of student's worries about their future as they are approaching graduation.

The result inferred from the study done by Martha L. Carver, Maureen O'Malley (2015) [20] states that since anxiety can be a problem which interferes with student learning during simulation, it may be beneficial to teach students an easy technique to lower their anxiety levels. Progressive Muscle Relaxation has the potential to decrease anxiety levels and in doing so might lead to clearer thinking and improved communications skills.

The study conducted by Bhawna Sharma, Ajesh Kumar, JyotiSarin (2016) [21] stated that use of remedial measures is highly benefited to students to reduce their stress and anxiety and to improve academic performance. This article recommended that the college should arrange the necessary environmental conditions to reduce the student's academic stress and anxiety. The most frequently noted form of academic stress and anxiety is academic stressors, social stressors, personal stressors, year of study, gender and teacher's stress. Use of effective stress reduction techniques is benefitted for students to reduce academic stress, anxiety and improve academic performance.

### Limitations

Some of the limitations observed in the present study were, only female participants included and study was conducted at one college, so the generalizability of the sample was limited. There were challenges in completing intervention session as students were scattered in different study levels and clinical training schedules.

### Recommendations

The present study recommends that similar study can be conducted with large number of students and include both gender in diverse academic settings. In the competing academic life, interventions like Progressive muscle relaxation training will

be very effective in reducing negative emotional states of students of any age group. So, educators can incorporate this training method as a part of co-curricular activities to improve student's motivation, communication skills and feel them relaxed while studying.

### CONCLUSION

From the present study it was found that, even though a good number of students had normal emotional states, most of the students' experienced negative emotional states of depression, anxiety and stress categorized as mild, moderate, severe and extremely severe levels. The study suggests the potential benefits of progressive muscle relaxation training in reducing negative emotional states of depression, anxiety and stress among undergraduate nursing students. Progressive muscle relaxation technique is very effective in reducing depression, anxiety and stress among nursing students. After intervention most of the participants felt relaxed and reduced the severity of negative emotional states and returned to the normal state of emotion. When progressive muscle relaxation is practiced and incorporated into student's daily routine, it would definitely help them to alleviate negative emotional states and better cope up with the daily hassles of academic life.

**Conflict of interest:** Authors declare no conflict of interest.

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