

**EFFECT OF DIFFERENT RELAXATION
TECHNIQUES ON DEPRESSION IN ADOLESCENT
GIRLS: A RANDOMIZED CLINICAL TRIAL**

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ABSTRACT

Background: depression in adolescents is recognized as a serious psychiatric illness with extensive acute and chronic morbidity and mortality. Relaxation techniques considered as a tool for managing anxiety and depression by activation of the parasympathetic nervous system and diverting attention from negative thoughts, thereby helping to relieve anxiety, stress and tension in the body that lead to depression.

Purpose of this study: To investigate the effect of effect of different relaxation techniques on depression in adolescent girls. **Subjects and methods:** This study was carried upon 40 adolescent girls suffering from mild to moderate depression. Their age ranged from 15 to 20 years old and their BMI were not exceeded 30 kg/m². They were selected from Damietta middle and high schools. The participants were randomly distributed in two groups equal in number. Group (A) consisted of 20 girls who received progressive muscle relaxation and deep breathing exercises for 3 month 3 sessions / week, 30 minutes /session. Group (B) consisted of 20 girls who received yoga and deep breathing exercises for 3 month 3 sessions / week, 30 minutes /session. All females in both groups (A and B) were assessed pre- and post-treatment by using, Depression Anxiety Stress Scale 21. **Results:** The results revealed that there was statistically significant reduction in both groups (A & B) in mean value of DASS-21 (total score) with p-value was (p=0.00001), the results also revealed that there was a non- statistically significant difference between two groups in mean value of DASS-21 (total score) in both pre-treatment and post-treatment with p-value were (P=0.116) &

($p=692$) respectively. **Conclusion:** progressive muscle relaxation technique and yoga could be used as an effective treatment on depression in adolescent girls as it is safe and non-pharmacological therapeutic technique.

INTRODUCTION

Depression, is defined as a major public health problem that has a substantial impact on individuals and on society. Depressive disorders are common in the general population. Depression is characterized by behavioral, cognitive, and emotional features. Depressed patients often exhibit signs of dysphoric mood, loss of interest in normally enjoyable pursuits, self-neglect and social withdrawal, poor appetite or overeating, insomnia or hypersomnia, fatigue or loss of energy, low self-esteem, poor concentration or difficulty making decisions, and feelings of hopelessness [1].

Adolescent depression is a serious public health. Depression in adolescents is under-recognized and under treated despite its poor long-term outcomes, including risk for suicide [2]. Depression in adolescence can affect all areas of development, particularly social and educational, which may then confer further disadvantage on the depressed adolescent. Although the gender balance is equal in childhood, depression also becomes more common in girls than boys by adolescence [3].

Depression rates increase substantially during adolescence, and by age 18, an estimated 15% of teens will have experienced at least one episode of major depressive disorder (MDD), with females twice as likely as males to have developed MDD [4]. Depression leads to serious social and educational impairments and an increased rate of smoking, substance misuse, and obesity. It is important to recognize and treat this disorder. Depression in adolescents is a major risk factor for suicide, the second-to-third leading cause of death in this age group with more than half of adolescent suicide victims reported to have a depressive disorder at time of death [5].

Physiotherapy may be indicated to help girls with depression as it addresses human movement, function, physical activity and exercise in individual and group therapeutic settings. Additionally, it connects the physical and mental health needs of humans at a low cost and non-pharmacological alternative. For such, there are several extensive ranges of physical approaches such as physical activity, exercise, movement, relaxation techniques and body and movement awareness. These

approaches are aimed at symptom relief, the enhancement of self - confidence and the improvement of quality of life [6].

Relaxation techniques used in a wide scope of disorders. They are used for managing anxiety and depression [7].

Progressive muscle relaxation (PMR) is effective in reducing negative states of anxiety and stress that lead to depression by increasing positive feeling of relaxation. PMR designed to induce feelings of deep relaxation by systematically tensing and relaxing 16 muscle groups and by learning to discriminate between the sensations of tension and relaxation. PMR produce both cognitive and physiological relaxation. Participants instructed to focus on sensations associated with release of muscle tension and feelings of comfort [8].

Deep breathing exercise is a simple technique that can be practiced by almost anyone. Deep breathing exercises with prolonged exhalation with a 1:2 ratio inhalations and exhalations, stimulate the parasympathetic nervous system and diverting attention from negative thoughts and help to relieve anxiety, stress and tension in the body. It may be practiced sitting up or lying down. Breathing techniques can help to calm the nervous system very quickly; teens can use these techniques to relax before exams, help with sleep, and calm themselves down during emotional upheaval [9].

Yoga is a comprehensive system of practices for physical and psychological health and well-being that consist of four techniques: physical postures/exercises to promote strength and flexibility, breathing exercises to enhance respiratory functioning, relaxation strategies that focus on reducing tension and stress, and meditation/ mindfulness practices to enhance mind-body awareness and improve attention and emotion regulation skills [10]. Yoga practices reduce allostatic load in stress response systems. Stress induces imbalance of the autonomic nervous system (ANS) with decreased parasympathetic nervous system (PNS) and increased sympathetic nervous system(SNS) activity, underactivity of the inhibitory neurotransmitter, gamma amino-butyric acid (GABA) and increased allostatic load. Yoga practices correct underactivity of the PNS and GABA system through stimulation of the vagal nerves and reduce allostatic load resulting in relief symptoms of stress and depression [11].

Consequently, the purpose of this randomized controlled study was to investigate the effect of different relaxation techniques on depression in adolescent girls.

MATERIALS AND METHODS

Design of study:

Two groups pre- test and post- test experimental design. The participants were randomly distributed in two groups equal in number. group (A): This group consisted of 20 girls with mild to moderate depression, they received progressive muscle relaxation techniques, in addition to diaphragmatic breathing exercises. group (B): This group consisted of 20 girls with mild to moderate depression, they received yoga, in addition to diaphragmatic breathing exercises.

Participant:

This study was carried upon forty adolescent girls with mild to moderate depression. They were selected randomly from the high and middle school in Damietta, on the following criteria: (1) their ages ranged from 15 to 20 years old; (2) their body mass index (BMI) was not exceeding 30 kg/m²; (3) they were suffering from mild to moderate depression; (4) all participants were conscious and free from any medical disease (detailed medical history was obtained to screen for other pathological conditions).

Measurement Procedures:

All participants were given a full explanation for the evaluation and treatment procedures and informed consent form was signed by each participant. All information including name, age, address, occupation was recorded at a recording data sheet.

The Depression Anxiety Stress Scale - 21 (DASS-21): Severity of depression was assessed through DASS-21 for each female in both groups A & B before and after treatment. It has been developed as a measure of anxiety and depression. DASS-21 is a measure of three distinct negative affects: depression, stress, and anxiety. It is a 4-point Likert scale ranging from 0 (Did not apply to me at all) to 3 (Applied to me very much, or most of the time) which indicate the extent the respondents experience each of the symptoms [12].

Treatment procedures:

Group A:

This group consisted of 20 females, all participants in group (A) received progressive muscle relaxation training for 30 min. / session, three sessions per week for three months. The patients were instructed to contract and relax the 16 muscle groups while sitting on a chair with back supported as follow: first, force tension with the muscles, and concentrate on the feeling of tension; try to hold this feeling of tension for 3 to 5 seconds, and then relax for 10 to 15 seconds. The patient should experience the sensation of muscle relaxation. patients were taught to relax muscles of foot, leg, hip and waist, chest, arm, shoulder, and face. Patients were taught to relax muscles of foot, leg, hip and waist, chest, arm, shoulder, and face. In addition to diaphragmatic breathing exercises were done in lying down,

sitting position or any other comfortable position. In the supine position one hands placed on the epigastric area and the other hand placed on the chest, they were asked to breathe in air through their nose and bulge the abdomen outward as far as Possible, hold their breath for a few seconds, and then exhale slowly through their mouth. They were instructed to perform breathing exercises 3 times/ day or when experience anxious or stressful situation during a day as 3 breaths per time and not exceed 4 breathes per time to prevent hyperventilation

Study group (Group B):

This group consisted of 20 females, they treated with yoga in addition to breathing exercise as described for group A.

All participants in group (B) practice yoga for 45 min. / session, three sessions per week for three months. A typical yoga session consisted of the following segments: breathing exercises (5 min), warm-ups (5 min), yoga poses (30 min), and relaxation (5 min). Commonly practiced poses included Sukhasna, cat cow pose, mountain pose, tree pose, five-pointed star, one legged wind removing and Warrior II Pose.

Data analysis: Statistical analysis was conducted using SPSS for windows, version 23 (SPSS, Inc., Chicago, IL). The data has been collected before and after three months of treatment for the two groups through: descriptive statistics: the mean and standard deviation and inferential statistics: by using t-test (test of difference).

RESULTS

The current study was conducted on 40 participants. They were assigned into two equal groups. Group (A) consisted of 20 participants who received progressive muscle relaxation training in addition to breathing exercises. Group (B) consisted of 20 participants who practice yoga in addition to breathing exercises. There were no significant differences ($p > 0.05$) in the mean values of age, body mass, height and BMI between both tested groups (Table1).

Table (1): Physical characteristics of participants in both groups (A&B).

Items	Group A	Group B	MD	Comparison		S
	Mean \pm SD	Mean \pm SD		t-value	P-value	
Age (years)	17.8 \pm 1.36	18.35 \pm 1.34	-0.55	-1.284	0.207	NS
Body mass (Kg)	60.9 \pm 11.52	61.95 \pm 9.86	-1.05	-0.31	0.759	NS
Height (cm)	161.25 \pm 4.86	164.1 \pm 6.18	-2.85	-1.62	0.113	NS
BMI (kg/m ²)	23.4 \pm 3.95	22.89 \pm 3.13	0.515	0.457	0.651	NS

*SD: standard deviation, MD: Mean Difference P: probability, S: significance, NS: non-significant.

As presented in table (2), Multiple pairwise comparison tests revealed that there was significant reduction of DASS-21 (total score) at

post treatment in compare to pre-treatment in group A with (P-value =0.00001). Considering the effect of the tested group on DASS-21 (total score).

Table (2): Mean \pm SD and p values of DASS-21 (total score) pre and post-test at group A.

	DASS-21 (total score)				
	Pre-treatment Mean & SD	Post-treatment Mean & SD	t- value	P- value	Sig.
Group (A)	25.775 \pm 4.91	5.6 \pm 1.66	24.91	0.00001	S

\bar{x} : Mean P-Value: Probability value SD: Standard Deviation t-value: paired t-test S: significant

As presented in table (3), Multiple pairwise comparison tests revealed that there was significant difference of DASS-21 (total score) at post treatment in compare to pre-treatment (P-value =0.00001) in group (B). Considering the effect of the tested group on DASS-21 (total score).

Table (3): Mean \pm SD and p values of DASS-21 (total score) pre and post-test at group B.

	DASS-21 (total score)				
	Pre-treatment Mean & SD	Post-treatment Mean & SD	t- value	P- value	Sig.
Group (B)	27.95 \pm 3.64	5.4 \pm 1.5	31.32	0.00001	S

\bar{x} : Mean P-Value: Probability value SD: Standard Deviation t-value: paired t-test S: significant

As presented in table (4), The results revealed that there was a non-statistically significant difference between the two groups in mean value of DASS-21 (total score) in both pre-treatment and post-treatment with p-value were (P=0.116) & (p=692) respectively.

Table (4) Mean \pm SD and p values of DASS-21 (total score) pre and post-test in both groups

DASS-21 (total score)	Group (A)	Group (B)	MD	t- value	P- value	Sig.
Pre-treatment	25.77 \pm 4.91	27.95 \pm 3.64	-2.20	-1.606	0.116	NS
Post-treatment	5.6 \pm 1.66	5.4 \pm 1.5	0.2	0.399	0.692	NS

\bar{x} : Mean P-Value: Probability value SD: Standard Deviation t-value: paired t-test S: significant

DISCUSSION

This study was conducted to determine the effect of effect of different relaxation techniques on depression in adolescent girls. This study demonstrates that the study group A which received progressive muscle relaxation techniques in addition to breathing exercises and the study group B which practiced yoga in addition to breathing exercises showed improvement in severity of depression.

Regarding the effect of relaxation techniques, the results of this study were in agreement with Merakou et al [7] who indicated the positive effect of the PMR technique on anxiety and stress reduction as well as providing relief from symptoms of depression and depression related behaviors

Vázquez, et al. [13] indicated that prevention of depression in university students can be done by using relaxation techniques which are a simple psychological treatment that can be administered after brief training especially muscle relaxation training which has been reported to reduce depressive symptoms.

The results of this study were agreed with Hauenstein, who found that using progressive muscle relaxation reduce anxiety and decrease depressive symptoms in adolescents [14].

Liao et al. [15] found that after using PMRT, patients who suffer from mild and moderate depression showed improvement in depression symptoms.

Regarding the mechanism of PMR in improving severity of depression it is based

on the finding that anxiety states are usually accompanied by increased muscle tension, while in resting states the muscles are relaxed [7].

Regarding the effect of yoga in improving severity of depression. The results of our study agreed with de Manincor et al. [16] who found that yoga practice reduce symptoms of depression and anxiety, and associated with increase in positive emotions and well-being for a person with mild or moderate depression.

The results of this study come in agreement with Gwalani, and Perumal [17] who indicated that yoga should be implemented at young age so it can help to reduce stress, balance emotions, improve mood and develop physical fitness. Yoga builds self-esteem and boosts self-confidence in children and adults. It reduces absence and violence in school children. Encourages love and self-care, and promotes mindfulness. Also improves the quality of sleep. Boosts immunity and improves physical appearance.

Regarding the mechanism of yoga in improving severity of depression Kumar, [18] found that. Yoga not only direct or redirect physical action and behaviors but it stimulates various glands, muscles and parts of the body related to emotional reactivity or states of mind. The nervous system can be activated or soothed through asana, breath and the metaphors of the poses. So that yoga could help the teenagers to get healthy, physically as well as mentally.

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تأثير وسائل الاسترخاء المختلفة على الاكتئاب لدى المراهقين

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الهدف: أجريت هذه الدراسة لمعرفة تأثير وسائل الاسترخاء المختلفة على الاكتئاب لدى المراهقين. **الطريقة:** مجموعه من 40 شخصًا شاركوا في هذه الدراسة تتراوح أعمارهم بين 15

و 20 عامًا خضعوا لتمارين الاسترخاء التدريجي للعضلات و تمارين التنفس في (المجموعة التجريبية 20شخصًا) و تمارين اليوجا و النفس في (مجموعة الجريبية 20شخصًا). تم تقييمهم قبل العلاج وبعد 3 شهور باستخدام مقياس الاكتئاب والقلق و التوتر . **النتائج:** أظهرت النتائج انخفاضًا معنويًا في كل من المجموعتين التجريبتين في القيمة الكلية لمقياس الاكتئاب و القلق و التوتر. **الاستنتاج:** وسائل الاسترخاء المختلفة يمكن ان يكون لها تأثير على علاج الاكتئاب لدى المراهقين من البنات.

الكلمات الداله: وسائل الاسترخاء المختلفة ،المراهقين ، اكتئاب، مقياس الاكتئاب والقلق و التوتر.