

# Effectiveness of Progressive Muscle Relaxation on Minimizing Stress among Women with Infertility

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## Abstract

Infertility harms women's relationship with family and friends, it is affected the relationship between the couple's sexual relationship and cause stress. Progressive muscle relaxation is considered one of the common methods used to minimize stress. So the study was aimed to determine the effectiveness of progressive muscle relaxation on minimizing stress among women with infertility. **Subjects and method:** A quasi-experimental research design with a pretest-posttest was utilized on a purposive sample of 70 women who randomly was divided into two groups, from a population of 386 women in six-months, from the beginning of September 2019 to the end of February 2020, who attended at the obstetric clinic at Bani-Suif University Hospital, Egypt. Two tools were utilized to collect data in this study: (1) a socio-demographic and fertility history structured interview schedule, (2) Newton's infertility stress questionnaire was used for data collection. After assessing and evaluating stress levels, the Progressive muscle relaxation technique was implemented in the intervention group. **Results:** t-test indicated that there were significant differences in stress scores between the two groups after the intervention ( $p < 0.05$ ) of the Progressive muscle relaxation technique. The stress means the score was higher in the control group compared to the intervention group. **Conclusion:** Progressive muscle relaxation technique was effective in minimizing the stress score among infertile women as alternative medicine method. **Recommendations:** Providing health education program to pregnant women progressive muscle relaxation technique that they can help in providing support.

**Keywords:** progressive muscle relaxation, stress, infertile women.

## Introduction:

Infertility is described as couples who have never been pregnant after at least one year of marriage. Infertility is occurred in 10% to 15% percent of the couples. Approximately 50 to 80 million people all around the world have infertility and the number is increasing. Couples may be experienced primary or secondary infertility. The incidence of primary infertility is 1% to 8% and secondary infertility is about 35 %. It is observed that 1 among 8 couples have a problem in getting pregnant (**Fast Facts about Infertility, 2017**).

Infertility has negative psychological effects on the couples which causes severe stress on them and causes other emotions as anger, sadness, frustration, despair, and distress. Furthermore, infertility may cause an injury in the life of infertile people and this injury or disorder can cause stress. The

incidence of psychological symptoms among infertile people concluded that 25% to 60% of them report psychiatric symptoms and that their levels of anxiety are significantly higher than in fertile people (**Berardis et al., 2014**).

The study results of Peterson et al. in 2006 reported that there was no way of adaptation for men and women with infertility stress and this would itself increase the couples' stress. Stress minimizing can occur by using two methods such as using the pharmacological methods and non-pharmacological methods as hypnosis, reflexology, and relaxation. So that, the efficacy of psychological interventions in lowering psychological distress as well as being associated with significant increases in pregnancy rates (**Kristin and Rooney, 2018**).

Stress is defined as the body's reaction to harmful situations -- whether they're real or perceived. During stress response, the heart

rate increases, breathing quickens, muscles tighten, and blood pressure rises. Stress can affect all aspects of life, including emotions, behaviors, thinking ability, and physical health. A little stress every now and then is not something to be concerned about but ongoing and chronic stress can cause many serious health problems, including mental health problems, such as depression, anxiety, and personality disorders, cardiovascular disease, including heart disease, high blood pressure, abnormal heart rhythms, heart attacks, and stroke, obesity, menstrual problems, sexual dysfunction, such as impotence and premature ejaculation in men and loss of sexual desire in both men and women, skin and hair problems, such as acne, psoriasis, and eczema, and permanent hair loss, and gastrointestinal problems, such as GERD, gastritis, ulcerative colitis, and irritable colon (Ann, 2020)

A progressive muscle relaxation technique (PMRT) is considered one of the non-pharmacological interventions to relieve these problems. It reduces stress by its effect on mental and physical conditions, mood, depression, and anxiety. Relaxation methods are very important tools for dealing with stress by giving the body/mind the chance to make their healing. The relaxation method causes harmony and helps to create these conditions for optimum living and have been widely shown to reduce negative emotions in a range of medical patients (Frederiksen, et al. 2017)

Some people need help and training to understand how to relieve mental and physical stress through applying relaxation methods, among these relaxation methods, progressive muscle relaxation technique, is the easiest one to be learned and administered, inexpensive, available at any time, self-induced by the patient, and without side effects. It increases the body's immunity and sense of well-being through endorphins release. The client with stress, tension headaches, insomnia, muscle spasms; lower back pain, fatigue, irritable bowel, and hypertension are among those, can achieve positive results by using this technique (Krupinska and Kulmatycki, 2014). The awareness of the relaxing sensation is one of the greatest gains realized with progressive muscle relaxation (Cooke, 2013).

A progressive muscle relaxation technique is considered one of the effective methods to be used and applied widely that can balance the body's stress. Therefore, the community and psychiatric nurses play an important role in infertile people who need psychological care through counseling, support, health education, and also accurate treatment. Emphasis on medical intervention and surgery, helping in treatment interventions to perform psychological rehabilitation of the couples, and the physician and the nurse should avoid merely medical monitoring and should also support the couples emotionally (Rooney and Domar, 2017). Despite the importance of reducing stress among infertile women, there is a lack to evaluate the effect of PMRT on stress among infertile women in Egypt. Therefore, the study was aimed to determine the effectiveness of progressive muscle relaxation on minimizing stress among women with infertility.

#### **Significance of the study:**

Infertile women who undergo reproductive treatments are more liable for stress than other physical diseases; most of these women have reported symptoms of stress after the unsuccessful treatment which would take a long time (Alami et al., 2009). Stress minimizing can occur by two methods; using non-pharmacological methods such as hypnosis, reflexology, relaxation, and using pharmacological methods (Stefanac and Nesbit, 2007).

#### **Aim of the study**

The study was aimed to determine the effectiveness of progressive muscle relaxation on minimizing stress among women with infertility.

#### **Research hypothesis:**

Infertile women who will implement the progressive muscle relaxation technique have less stress than those who do not implement it.

#### **Subjects and Methods:**

##### **Research design:**

A quasi-experimental research design with a pretest-posttest was utilized in this study. It

used for establishing the cause-and-effect relationship between an independent and dependent variable. It does not rely on random assignment. Instead, subjects are assigned to groups based on non-random criteria. It is a useful tool in situations where true experiments cannot be used for ethical or practical reasons (Lauren, 2020).

#### Setting:

The study was conducted at the obstetric clinic affiliated to Bani-Suif University Hospital, Egypt. The mentioned setting was selected due to the high prevalence of infertile women on the selected setting and also it serves the biggest region of population.

#### Subjects:

A purposive sample of 70 infertile women from a population of 386 women in six-months attended the obstetric clinic at Bani-Suif University Hospital, Egypt, from the beginning of September 2019 to the end of February 2020. They were randomly divided into two intervention and control groups using simple random sampling (thirty-five subjects in the intervention group and thirty-five subjects in the control group). The inclusion criteria included the women diagnosed with infertility, the age range of 18 to 35 years old, and the tendency to participate in the study. The exclusion criteria also included psychological illness, physical illness, and injury, using drugs or mental medicine.

#### Tools of data collection:

Two tools were used to data collection of the study as the following:

**Tool I: A socio-demographic and fertility history structured interview schedule** was developed by the researchers after reviewing the related literature and research studies. It included two parts:

**Part (1):** It included socio-demographic data related to age, educational level, occupation, and residence.

**Part (2):** It included menstrual and infertility history as menarche age, menstrual regularity, duration of the marriage, and duration of infertility.

#### **Tool II: Newton's infertility stress questionnaire:**

It was used to assess stress and consisted of 46 questions, which assessed concerns of the

infertile women in five dimensions; social, sexual, communication, lifestyle without a child, and the need of being parents.

Positive questions score in Newton's infertility stress questionnaire was as the following: Strongly agree (6 scores), agree (5 scores), somewhat agree (4 scores), somewhat disagree (3 scores), disagree (2 scores), and strongly disagree (1 score). Negative questions score in Newton's infertility stress questionnaire was also as the following: Strongly agree (1 score), agree (2 scores), somewhat agree (3 scores), somewhat disagree (4 scores), disagree (5 scores), and strongly disagree (6 scores).

The reliability of Newton's infertility stress questionnaire was done by Alizadeh et al. (2005); therefore, the questionnaire used had already been investigated in terms of reliability.

#### Methods and Phases of Data Collection:

##### Validity and reliability of the tool:

The content validity of the tool was reviewed by five experts in obstetrics & gynecological, community health nursing, and psychiatric nursing field before using it with the responsive infertile women in the study. The Reliability of the tool was assessed through Cronbach's alpha test  $\alpha = 88\%$ .

##### Ethical considerations:

Official permission was obtained through an issued letter from the Dean of Faculty of Nursing, Bani-Suif University to conduct this study. The aim of the study was explained to obtain permission to collect the research data from the hospital under his directorate. The purpose of the study was explained to infertile women. The researcher informed the participants that, the study was voluntary, they were allowed to refuse to participate and they had the right to withdraw from the study at any time, without giving any reason. Moreover, they were assured that their information would be confidential and used for research purposes only.

##### A pilot study

A pilot study was conducted on 10% of the mothers (7 infertile women). The clarity and testing of the feasibility of the research process needed for modifications were carried

out based on the results of the pilot study to develop the final form of the tools. Pregnant women involved in the pilot were excluded from the study.

#### Fieldwork:

- Data Collection was within six months from the beginning of September 2019 to the end of February 2020.
- The participants were randomly divided into two intervention and control groups using simple random sampling (thirty-five subjects in the intervention group and thirty-five subjects in the control group).
- The participants in the control group received the routine care as ovulation testing, hysterosalpingography, ovarian reserve testing, other hormone testing, and imaging tests. Pelvic ultrasound looks for uterine or ovarian disease. Sometimes a sonohysterogram, also called a saline infusion sonogram, is used to see details inside the uterus that are not seen on a regular ultrasound. Depending on situation, rarely testing may include hysteroscopy and laparoscopy.
- In the control group, the researchers interviewed each woman individually for about 30 minutes; the researchers introduced themselves to the woman and explained the purpose of the study as well as oral consent was obtained from them then a socio-demographic and fertility history structured interview schedule and Newton's infertility stress questionnaire were collected from the woman without application of the progressive muscle relaxation technique.
- In the intervention group, the researchers interviewed each woman individually for about 30 minutes; the researchers introduced themselves to the woman and explained the purpose of the study as well as oral consent was obtained from them then a socio-demographic and fertility history structured interview schedule and Newton's infertility stress questionnaire were collected from the woman.
- In the current study, the questionnaire was distributed two times; pre and post the study
- For the rest of the week, participants followed the researcher's oral instructions at home. Continuation of doing exercises was followed by phone calls.
- In the intervention group training of each woman on progressive muscle relaxation technique started after Newton's infertility stress questionnaire pre-test was completed.
- The researchers gave information to the woman individually about the progressive muscle relaxation technique (Cooke, 2013).
- The subjects in the study group were asked to empty their bladder and be in a convenient position (sitting or lying). Progressive muscular relaxation was done using the Jacobson method by contracting and relaxing selected groups of muscles until total relaxation was achieved. In the intervention group, to perform the relaxation technique, the study infertile women were lying on the side with their legs fairly bent (no to put pressure on any of the muscles) and in a relaxed position with closed eyes and a combination of Jacobson relaxation technique and Benson's technique (deep breaths with mental imagery) was performed for 30 minutes in a room, no noise and proper lighting. In the Jacobson technique, the body muscles were divided into eight parts and during performing the technique, an active muscle contraction for 5 seconds and then release of the same muscles for 30 seconds (tension/rest) was implemented.
- The order of muscle contraction and release were as following: right foot, left foot, right hand, left hand, stomach and back, chest and the shoulders, face, head, and scalp. This technique was performed in the presence of the researcher by playing a CD which had already been recorded and prepared for all the subjects of the intervention group. The participants were advised to perform the technique every day, three times per day in the morning, evening, and night shifts with the help and supervision of the researchers. After 15 days, when the study subjects referred back to the clinics, the researcher also attended to the place to complete the last stage of the stress questionnaire.

- No intervention was done in the control group. They received routine care given in the clinic and used medications.
- After the relaxation training, the researchers demonstrated each step of the PMR technique then asked the woman to re-demonstrate it. The researchers then asked the woman to re-demonstrate all the steps and repeat the technique three to four times until the woman masters it.
- In both groups, the researchers reassess the stress level after two weeks with Newton's infertility stress questionnaire.

### Statistical analysis:

Data entry and statistical analysis were performed using SPSS for Windows, version 20. Data were presented using descriptive statistics in the form of frequencies and percentages for qualitative variables and mean and SDs for quantitative variables. Differences between the two means tests (t-test) were used. Chi-square ( $\chi^2$ ) test of significance was used to compare proportions between qualitative parameters. Pearson's correlation coefficient (r) test was used to assess the degree of association between two sets of variables. Statistical significance was considered at P-value  $<0.05$ .

### Results:

**Table (1):** Showed that respondents were aged  $\leq 30$  years, both in the intervention (study) group (72%) and the control group (84%). Less than half of the intervention group (46.7%) and nearly two-thirds of the control group (60%) had higher education levels. In the intervention group (70%) of women were housewives and in the control group (60%). More than two-thirds of the intervention group (66%) and more than three-quarters of the control groups (76.0%) were from urban areas. There was a significant difference between the control group and the intervention regarding sociodemographic characteristics ( $p = 0.001$ ).

**Table (2)** Revealed that the majority of the respondent's mean menarche age of the women was  $\leq 14$  years, both in the intervention group (73.3%) and the control group (86%). In the

intervention group (53.3%) and the control group (69%) of the women had menstrual regularity. The marriage duration in the intervention group (45%) was  $<3$  years and the control group (40%). More than two-thirds (66%) of the women their infertility duration was  $<5$  years in the intervention group and the control group (76%).

According to findings of **table 3**, regarding total stress score and stress scores in 5 dimensions of Newton's infertility stress questionnaire (social, sexual, communication, lifestyle without the child, and need of being parents), it was observed that the mean total stress score and the stress scores in 5 dimensions had no significant differences before the current study in the intervention and control groups ( $p > 0.05$ ). It was observed that it is noticed that the mean stress score in all the dimensions of Newton's infertility stress questionnaire (social, sexual, communication, lifestyle without child and need of being parents) and the total stress after the intervention had significant differences in both groups in which the mean score was higher in the control group than intervention group ( $p < 0.05$ ). The mean stress score had a significant difference pre and post the study in the intervention group and it reduced after the study ( $p = 0.000$ ). The mean stress score had a significant difference pre and post the study in the control group and it increased after the study ( $p = 0.000$ ).

**Figure (1):** Represented that, more than three quarter (80%) of the studied women before the intervention had severe level of stress while, these percentages decreased to be moderate in more than half of them (57%) post intervention.

**Table (4):** showed that a statistical significant relationship was found between Newton's infertility stress of the studied women in both groups and their age and educational level at ( $P < 0.000$ ).

**Table (5):** Revealed that there was a highly statistical significant relationship between Newton's infertility stress of the studied women in both groups and their infertility history pre and after the intervention at ( $P$  value  $< 0.001$ ).

**Table (1):** Percentage distribution of the studied women in both groups regarding their sociodemographic characteristics (n=70)

Item	Intervention (35)		The control group (35)		P-value
	No.	%	No	%	
<b>women ' age in years</b>					
≤30 years	25	72.0	29	84	0,265
>30 years	10	28.0	6	16	
<b>Women ' education</b>					
Illiterate	5	14.0	9	25	0,156
Elementary	14	40.0	5	15	
Higher	16	46.0	21	60	
<b>Occupation</b>					
Employee	11	30.0	14	40	0,455
Housewife	24	70.0	21	60	
<b>Residence</b>					
-Rural	12	34.0	8	24	0,136
-Urban	23	66.0	27	76	

\*Significance at 0.001 levels

**Table (2):** Percentage distribution of the studied women in both groups regarding their menstrual and infertility history (n=70)

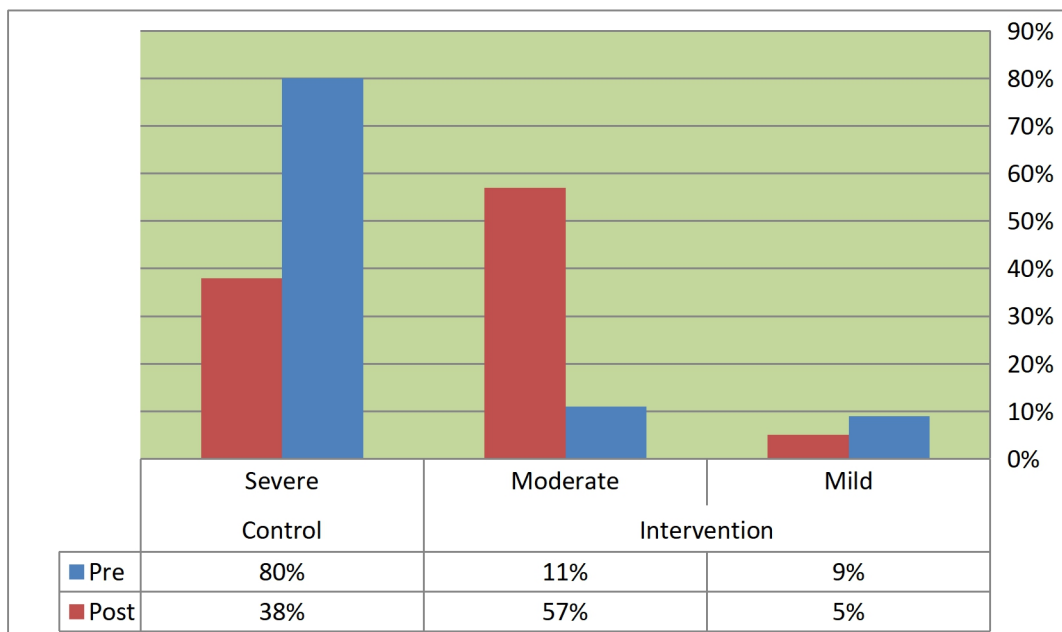
Item	Intervention (35)		The control group (35)		P-value
	No.	%	No	%	
<b>Menarche age</b>					
≤14 years	26	73.3	30	86	<0.001*
>14 years	9	26.7	5	14	
<b>Menstrual regularity</b>					
Yes	19	53.3	24	69	<0.001*
No	16	46.7	11	39	
<b>Duration of marriage</b>					
<3 years	16	45.0	14	40	<0.001*
3-5 years	12	35	9	25	
>5 years	7	20.0	12	35	
<b>Duration of infertility</b>					
<5 years	23	66.0	27	76	<0.001*
>5 years	12	34.0	8	24	

\*Significance at 0.001 levels

**Table (3):** Mean stress score in 5 dimensions of Newton's infertility stress questionnaire (social, sexual, communication, lifestyle without child and need of being parents) and total stress score and numerical statistical indicators in intervention and control groups' pre and post the study

Stress score	Intervention group				Control group				T	P
	Pre		Post		Pre		Post			
	Mean	SD	Mean	SD	Mean	SD	Mean	SD		
Social (from 60)	45.37	10.58	31.32	8.67	40.73	9.13	48.14	6.72	8.77	0.000
Sexual (from 42)	28.62	9	24.11	7.66	27.8	8.12	32.23	6.63	5.65	0.000
Communication (from 66)	27.69	13.1	20.80	8.55	29.89	11.26	34	12.65	4.5	0.000
Lifestyle with no child (from66)	48.56	12.77	36.24	8.43	51.24	8.96	51.82	3.6	11.56	0.000
The need for being a parent (from 42)	37.76	5.34	32.45	4.7	38.64	3.87	37.88	3	5.75	0.000

\*Significance at 0.001 levels



**Figure (1):** Percentage distribution of Newton's infertility stress among the studied women in both groups pre and post intervention.

**Table (4):** Association between mean stress score in 5 dimensions of Newton's infertility stress of the studied women in both groups and their age and educational level

Item	Newton's infertility stress				P-value
	Intervention (35)		The control group (35)		
	No.	%	No	%	
<b>Women' age in years</b>					0,265 P<0.000
≤30 years	25	72.0	29	84	
>30 years	10	28.0	6	16	
<b>Women' education</b>					0,156 P<0.000
Illiterate	5	14.0	9	25	
Elementary	14	40.0	5	15	
Higher	16	46.0	21	60	

\*Significance at 0.000 levels

**Table (5)** Association between mean stress score in 5 dimensions of Newton's infertility stress of the studied women in both groups and their infertility history

Item	Newton's infertility stress				P-value
	Intervention (35)		The control group (35)		
	No.	%	No	%	
<b>Duration of marriage</b>					<0.001*
<3 years	16	45.0	14	40	
3-5 years	12	35	9	25	
>5 years	7	20.0	12	35	
<b>Duration of infertility</b>					<0.001*
<5 years	23	66.0	27	76	
>5 years	12	34.0	8	24	

\*Significance at 0.001 levels

## Discussion:

Relaxation techniques such as methods of coping with stress, anxiety, and depression are simple psychotherapeutic methods and can be performed after brief training. Jacobson progressive muscle relaxation is common. This technique is very easy to learn and serves as one of the best complementary therapies due to ease of learning and cost-savings and because it does not require special equipment, allowing easy implementation (Alwan et al., 2018). Hence, the current study was aimed to determine the impact of progressive muscle relaxation on minimizing stress among women with infertility. This aim was significantly achieved because there were a statistically significant differences and reduction in post intervention stress level among infertile women compared to pre intervention.

Results of the present study proved that the mean total stress score and the stress scores in the 5 dimensions had no significant differences before the current study in the intervention and control groups ( $p > 0.05$ ), this may be indicated the need and the importance of implementing the progressive muscle relaxation technique as related methods that can lead to stress reduction.

Results of the present study proved that the mean stress score in all the dimensions of Newton's infertility stress questionnaire and the total stress after the intervention had significant differences in both groups in which the mean score was higher in the control group than the intervention group ( $p < 0.05$ ). The mean stress score had a significant difference pre and post the study in the intervention group and it reduced after the study ( $p = 0.000$ ). The mean stress score had a significant difference pre and post the study in the control group and it increased after the study ( $p = 0.000$ ). The results are supported by Kristin and Rooney, (2018), they found that psychological interventions as a progressive muscle relaxation technique for women with infertility decrease their stress and may well lead to significantly higher pregnancy rates.

These findings agree with Essa et al., (2017) in their study and that stress mean score had significantly decreased after the application of

progressive muscle relaxation technique between the intervention groups. This result indicates the positive impact of a progressive muscle relaxation technique—on the reduction of stress among women. A similar study was conducted by Damodaran et al. (2015) and they investigate stress management among adolescents and reported that progressive muscle relaxation technique was effective in reducing stress and stress manifestations.

Similarly, another study done by Montazeri et al. (2014), they had investigated the impact of stress management on volunteer mothers' depression and anxiety to cesarean surgery. They reported that mean scores of anxiety compared to the experimental group had a significant reduction. This present study result also is supported by Safi, (2015) who had studied the "Potential Mechanisms of Progressive Muscle Relaxation Therapy on Depression in Female Patients with Multiple Sclerosis" and concluded that progressive muscle relaxation technique is efficient in decreasing stress and depression.

These findings are in the same line with the study done by Saeideh et al., (2018) about the effectiveness of stress management programs on stress, depression, and anxiety of depressed patients. They found that progressive muscle relaxation technique could have a significant decrease in stress level in the study group compared to the control one.

The results of the present study showed that a statistical significant relationship was found between Newton's infertility stress of the studied women in both groups regarding their age and educational level at ( $P < 0.000$ ). This may be explained by that younger and low educational women' level had insufficient knowledge and difficulty in understanding the progressive muscle relaxation technique quickly than educated women.

The results of the present study revealed that there was a highly statistical significant relationship between Newton's infertility stress of the studied women in both groups regarding their infertility history pre and after the intervention at ( $P \text{ value} < 0.001$ ). This may be related to the duration of marriage and infertility that reflected increasing in duration of marriage without pregnancy and infertility is



meaning increasing in Newton's infertility stress.

### Conclusion:

The progressive muscle relaxation technique was effective in minimizing the stress score among infertile women as a complementary and alternative medicine method.

### Recommendations:

- Applying Progressive muscle relaxation technique in the maternal and child health care centers because it is simple, easy, and cost-effectively.
- Providing psychological support to help them to cope and become more resilient during their problem.
- Provide health education about the progressive muscle relaxation technique to infertile women.
- Encourage training programs for nurses in maternity and gynecological departments and community health nurses about the utilization of progressive muscle relaxation techniques are recommended.
- Future research includes replication of the present study under different circumstances and compares the effect of progressive muscle relaxation technique on management with other methods as the imaginary method.

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