

The effect of progressive muscle relaxation on pregnant women's general health

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ABSTRACT

Background: Pregnancy may be accompanied by serious physiological and psychological changes as it is a stressful period in a woman's life. So, this study was conducted to determine the effect of progressive muscle relaxation on pregnant women's general health.

Materials and Methods: In this clinical trial, 60 primigravida women admitted to the prenatal clinic of selected hospitals in Iran constituted the study population. Using purposive sampling method, the level of general health of the women was measured with General Health Questionnaire-28 (GHQ-28). Then, the samples were randomly divided into control and experimental groups. Three 1.5–2 h relaxation training sessions were held for the experimental group. After 8 weeks, the level of general health of both groups was measured again. Finally, the collected data were analyzed using Chi-square and paired *t*-test ($P < 0.05$).

Results: Total mean score of general health of the experimental group and the control group before the intervention was 35.83 (6.92) and 29.46 (8.3), respectively, and after the intervention, the respective scores were 20.2 (5.61) and 27.85 (8.24). Although after the intervention both groups showed an increased level of general health, the difference in general health between before and after intervention was significant in the experimental group ($P < 0.001$). Furthermore, comparison of variations in mean scores of general health level before and after intervention in the two groups showed a significant difference ($P < 0.001$).

Conclusions: Given that the results showed the effectiveness of progressive muscle relaxation on pregnant women's general health, the prenatal clinics can include a training program for progressive muscle relaxation in the routine training programs for pregnant women.

Key words: General health, GHQ-28, muscle relaxation, pregnant women, primiparous, progressive muscle relaxation

INTRODUCTION

Pregnancy is one of the most stressful periods in women's lifetime. The stress arising from first child birth is classified even as severe stress among the psychosocial stresses. According to the global statistics, 10–15% of pregnant women somehow experience different degrees of anxiety disorders and depression.^[1] Antenatal anxiety and depression are so prevalent and serious problems in pregnancy that more than half of the pregnant women have anxiety antenatally^[2,3] and results of studies show that there is an association between mental health of women during the prenatal period and the outcomes of pregnancy^[4] The above percentage depends on the gestational age, as in the second trimester and third trimester

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of pregnancy, the incidence was reported as 12–15%^[5,6] and 14%, respectively.^[5] A study also reported the percentage in the third trimester as 50%.^[7]

Psychological pressures during pregnancy, delivery, and breastfeeding may lead to adverse outcomes including abortion, vomiting, diarrhea, preeclampsia, weight loss, premature delivery, immune suppression, and subsequently, increase in episiotomy and neonatal infections and also degrees of postpartum psychological disorders.^[8-10] A significant correlation has been also reported between reduced quality of life (QOL) and the above factors such as depression or general health problems.^[6,10]

Relaxation is a behavioral tool which is called behavioral aspirin. It is a new method that probably constitutes the core

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of treatments for anxiety and mental stress and a disciplinary method that is internalized with practice.^[11] Relaxation techniques that include muscle relaxation and breathing exercises are among the physiological mechanisms that link the mind and the body, and as a non-medicinal method, they have positive effects on stress management in physical, mental, and social dimensions of general health and also on anxiety. This technique is widely used in research, and reduces stress, and learning to sense and control muscle tension constitutes its basis of treatment.^[12]

Different studies have examined the effects of the method on various groups; however, only a few studies have examined those effects on pregnant women who are among the vulnerable groups in the society. In Urech *et al.*'s study on the effects of relaxation on mental health during pregnancy, the results showed useful effects of relaxation methods on physical and psychological system.^[13]

During pregnancy, relaxation exercises relieve mother's body and soul of fatigue. This has been reported to soothe minor and common pregnancy discomforts.^[14] Many studies on the psychological effectiveness of progressive muscle relaxation also found similar results. In this regard, a quasi-experimental study with the objective of examining the effect of progressive muscle relaxation on anxiety of nursing students showed a significant difference between anxiety mean scores of the experimental and control groups after muscle relaxation training, as the anxiety in the experimental group was reduced.^[15]

Furthermore, results of the studies on the effects of progressive muscle relaxation in women with bronchial asthma showed that progressive muscle relaxation was an effective method for improvement of blood pressure, pulmonary parameters, and heart rate, and reduction of state-trait anger; consequently, the QOL related to the health of pregnant women with bronchial asthma was improved.^[16] Results of many studies have shown the effectiveness of progressive muscle relaxation on many illnesses such as reduction of pain in multiple sclerosis patients,^[17] anxiety in pulmonary disease,^[18] and anxiety and depression, nausea, and vomiting in cancer patients.^[19,20] Also, some studies reported that progressive muscle relaxation training could improve the QOL and decrease pain in pregnant women with low back pain^[21] and reduce stress in pregnant women.^[22] But no study has reported exactly about the effects of progressive muscle relaxation on prenatal mental health.

Mental health in pregnant women reduces maternal and neonatal complications. So, nurses should assess coping of women during pregnancy and plan programs.

Community-based programs that promote healthy coping can optimize maternal and newborn health. Borchering (2009) quoted Lowenkron as saying that nurses and the other health professionals have many opportunities to impact coping styles during the prenatal period. A stronger effort could be made to assess coping during the prenatal period and incorporate healthy ways of coping into the plan of care.^[23]

Results of many studies have shown that severe stress during pregnancy can affect the pregnancy outcome.^[8-10,24] Considering the mutual relationship between body and psyche, excessive vulnerability of pregnant women, the direct impact of mental stress on the mother's and fetus's health, the emphasis on the effectiveness of social support and care for women during pregnancy on mental health after child birth, and lack of similar studies in this regard, the present study was conducted to determine the effect of progressive muscle relaxation as a non-pharmacological method on pregnant women's general health.

MATERIALS AND METHODS

Sixty primigravida women meeting the inclusion criteria of the study, who referred to the prenatal clinic of a selected hospital in Tehran, Iran, constituted the population of this clinical trial. They were in the first trimester of pregnancy (up to 12 weeks) and in the age range of 18–35 years.

The studied samples were selected with the following inclusion criteria: Primigravida in the first trimester, single pregnancy, no high-risk pregnancy such as history of diabetes, hypertension, mental disorders, and use of antidepressants. Then, the participants were randomly divided into control ($n = 30$) and experimental ($n = 30$) groups. At first, the participants' level of general health was measured with General Health Questionnaire-28 (GHQ-28); next, the experimental group subjects were given training in Progressive Muscle Relaxation Technique (PMRT), which has been in use since its introduction in 1938 by Edmond Jacobson.^[25]

The training for PMRT was administered as three sessions conducted theoretically and practically every other day in a week, with duration of 1.5–2 h in each session. In the sessions, the pregnant women were familiarized with the concept of relaxation technique and the role and importance of performing the relaxation technique; following this, and the research units were requested to practice the technique step by step. After teaching and making sure that the participants have learnt the practical training, the training CD was prepared and the participants were provided with the contents of the above-mentioned method, so that they

listen to it during practicing at home. The participants performed the practices for 8 weeks, at least twice a day at home, and recorded the results of the practice in a daily report checklist. Meanwhile, during these 8 weeks, the researcher was in contact with the participants by telephone to answer their questions and follow them to ensure that they were doing the practice.

In this study, we had 18 cases as sample attrition based on exclusion criteria included: Dissatisfaction of the pregnant women to continue participating in the study, being absent for more than one session of the training class, failure to do the practices regularly during 8 weeks, and failure to complete the checklist. During this period, no intervention was administered in the control group. Finally, 8 weeks after intervention, general health of both groups was measured using GHQ-28. In this study, the data were collected using demographic information questionnaire and GHQ-28.

GHQ is a self-reporting screening questionnaire with 28 items and four subscales. All the items are scored with a 4-point Likert style (0–3). Total score of each participant is the sum of scores of the four subscales, which ranges from 0 to 84. And the lowest score represents the highest level of general health.^[26,27] This questionnaire has been used as a standard instrument in numerous studies and its scientific reliability and validity have been measured.^[28-31] Data were entered into SPSS-15 software. To interpret and analyze the data, descriptive statistics of mean and standard deviation, and inferential statistics of paired and independent *t*-tests and Chi-square test were used ($P < 0.05$).

For the research ethics, all participants signed the informed written consent forms after receiving sufficient information about the research and its objectives, and those who did not want to continue taking part in the study were excluded.

The Ethics Committee of Baqiyatallah University of Medical Sciences approved the study. The pregnant women were informed about the aims of the study and also about being free to withdraw from the study at any time. Also, in this study, the control group merely benefited from routine education and care. For ethical considerations, by the end of the study, necessary training for relaxation as well as educational notes were provided, and the training CD was also given to the control group after the test.

RESULTS

Regarding demographic information, the results showed that most of the study subjects had educational degree of high school diploma or higher and were housewives. Also,

they had been regularly referring to the prenatal clinic for getting routine prenatal care and there was no significant difference between the characteristics of the control and the experimental groups [Table 1].

Before the intervention, total score of general health of the experimental group and the control group was 35.83 (6.92) and 29.46 (8.3), respectively, and after the intervention, it was 20.2 (5.61) and 27.85 (8.24), respectively. Furthermore, paired *t*-test showed a significant difference on comparing the mean scores of women's general health before and after intervention in the experimental group ($P < 0.001$) [Table 2], but it showed no significant difference in the control group [Table 3].

Comparison of the mean difference in the four subscales of physical symptoms, anxiety and insomnia, social functioning disorder, and depression by paired *t*-test showed a significant difference ($P < 0.001$) before and after intervention in the experimental group, but in the control group, this difference was not significant.

Also, the mean difference of general health in the experimental group before and after intervention was obtained as 15.63 (5.73), whereas it was 4.77 (1.96) in the control group, and paired *t*-test showed a significant difference on comparing this mean difference ($P < 0.001$) [Table 4].

Table 1: Distribution of control and experimental groups based on demographic information

Group variable	n (%)		P
	Control	Experimental	
Age, years			
18-23	7 (23.3)	12 (40.1)	0.2
24-29	11 (36.6)	10 (33.3)	
30-35	12 (40.1)	8 (26.6)	
Gestational age, weeks			
1-4	3 (10)	10 (33.3)	0.13
5-8	12 (40)	6 (20)	
9-12	15 (50)	14 (46.7)	
Educational degree			
Diploma	11 (36.7)	13 (43.3)	0.14
BS or higher	19 (63.3)	17 (56.7)	
Employment status			
Employer	7 (23.3)	8 (26.6)	0.48
Housewives	23 (76.7)	22 (73.3)	
Regularly referring to prenatal clinic			
Yes	22 (73.3)	27 (90)	0.06
No	8 (26.7)	3 (10)	

Chi-square test was used: $P > 0.05$. all of non-significant

Table 2: Comparison of mean scores before and after the intervention in the experimental group

Subscale stage	Mean (SD)				
	Physical symptoms	Anxiety and insomnia	Social functioning disorder	Depression	Total score
Before intervention	10.07 (2.55)	10.53 (2.71)	11.03 (1.97)	4.20 (2.88)	35.83 (6.92)
After intervention	5.53 (2.54)	5.77 (3.30)	6.97 (2.00)	1.93 (1.36)	20.20 (5.61)
P value	<0.001	<0.001	<0.001	<0.001	<0.001

Paired t-test was used: $P < 0.001$. SD: Standard deviation**Table 3: Comparison of mean scores before and after the intervention in the control group**

Subscale stage	Mean (SD)				
	Physical symptoms	Anxiety and insomnia	Social functioning disorder	Depression	Total score
Before intervention	8.60 (3.11)	8.60 (2.97)	8.63 (2.25)	3.63 (2.37)	29.46 (8.3)
After intervention	8.67 (2.86)	7.30 (2.96)	8.5 (2.76)	3.03 (2.34)	27.85 (8.2)
P value	0.82	0.04	0.74	0.8	0.06

Paired t-test used: $P < 0.05$. SD: Standard deviation**Table 4: Comparison of the mean difference scores of general health in the control and experimental groups before and after intervention**

Subscale group	Mean (SD)				
	Physical symptoms	Anxiety and insomnia	Social functioning disorder	Depression	Total score
Experimental	4.53 (2.30)	4.76 (3.14)	4.06 (1.85)	2.26 (2.28)	15.63 (5.73)
Control	0.07 (1.68)	1.30 (2.10)	0.13 (2.20)	0.60 (1.86)	1.96 (4.77)
P value	<0.001	<0.001	<0.001	<0.001	<0.001

Independent t-test used: $P < 0.001$. SD: Standard deviation

DISCUSSION

The main objective of this study was to determine the effect of progressive muscle relaxation on the general health of pregnant women referring to the prenatal clinic of the selected hospital in Tehran. The results of the present study on the effects of relaxation training on different aspects of pregnant women's general health, including anxiety and insomnia, showed a significant difference between the general health scores of pregnant women before and after intervention.

Pregnancy, as an important event in the life of a woman and her family, causes major changes in the woman physically (physiologic and anatomic) and psychologically. However, studies on the psychological aspect of the changes are lesser than those on the physical aspect of changes.^[1] Due to the abundant different stresses during pregnancy and the physical and mental adverse effects of stress on pregnant women and their fetuses, learning the methods meant for coping with stress is of special importance during this period. Although there is no similar study, the above result agreed with those of related studies, including Marc *et al.*'s study which examined the effects of relaxation on mental health during pregnancy and showed useful effects of relaxation on physical and psychological systems.^[32] Other similar studies examined the effect of progressive muscle relaxation in other conditions; Nickel *et al.* reported the effectiveness

of progressive relaxation training in improving QOL and reducing anger signs in women with bronchial asthma.^[16] Mark and Lee examined the studies performed during 1980–2007 on the effect of mind–body interventions on pregnant women's temperament, perceived stress, and pregnancy outcomes. In the above studies, progressive muscle relaxation was the most common intervention. The results show effects such as increased birth weight, decreased duration of delivery, lesser use of instruments for delivery, and reduction of perceived anxiety and stress.^[32]

Also, Bastani *et al.*'s study conducted in Iran on the effect of relaxation training based on self-efficacy theory on pregnant women's mental health showed that the training program reduced the three dependent variables (state anxiety, trait anxiety, and perceived stress) in the experimental group significantly.^[33] Also, use of progressive muscle relaxation in various diseases has been shown to improve mental health. This has been reported, for example, in Sierpina *et al.*'s study in patients with headache, Khanna *et al.*'s study on reduction of stress and heart rate, Chen *et al.*'s study on schizophrenia, and Ghafari *et al.*'s study on reduction of anxiety in multiple sclerosis patients. The results of these studies are in agreement with our results.^[34–37] Also, in a review study, Brenes *et al.* emphasized the effectiveness of progressive relaxation training in reducing stress of patients with chronic obstructive pulmonary disease (COPD).^[24] In another study, Yoo *et al.* examined the effect of muscle

relaxation and guided imagery on the symptoms of depression, anxiety, and anger and life quality of women with breast cancer in Seoul. The results showed that both the level of depression and anxiety and QOL in patients of the experimental groups were significantly lesser than those in the control group. Therefore, the researchers mentioned that these methods were useful in improvement of mental symptoms and QOL in patients with breast cancer.^[38]

Time consumption because of the high number of samples of pregnant women followed up after training and high sample attrition following obstetrical intervention or unwillingness to continue participation in the study were the limitations of this study. Another limitation was individual differences in participants' mental and emotional aspects in doing the practice, that may be affect on muscle relaxation. Also, absence of study subjects in training sessions, requiring individual repeat training, and lack of response to 8-week follow-up after training led to exclusion and replacement of some subjects. Existence of only few relevant studies, due to which there was limited chance of comparison of results with other studies, and lack of generalizability of results were among the other limitations of this study, which necessitates more comprehensive studies to be conducted in future.

CONCLUSION

The study results demonstrated significant difference between the general health scores of women in the experimental group and the control group in terms of physical, psychological, and social aspects. In general, the results confirmed the hypothesis of the study on the effectiveness of relaxation on pregnant women's general health. Thus, considering the effectiveness of the method, lack of side effects, especially during pregnancy, and its cost-effectiveness, it is recommended to be used for pregnant women.

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