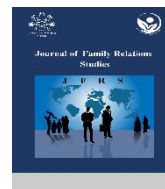




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### Research Paper

## Effectiveness of Emotion Regulation Training on Improving Sexual Function and Psychological Distress Among Partners of Pregnant Women



Marzie Hashemi<sup>1\*</sup> , Seyed Ali Kazemi Rezaei<sup>2</sup> & Farhanaz Taherinejad<sup>3</sup>

1. Assistant Professor of Psychology, Department of Psychology and Education, Faculty of Humanities, Khatam University, Tehran, Iran.
2. Assistant Professor of Psychology, Department of Psychology and Education, Faculty of Humanities, Khatam University, Tehran, Iran.
3. Master of General Psychology, Daneshalborz University, Qazvin, Iran.



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#### ABSTRACT

**Objective:** This research aimed to examine the effectiveness of emotion regulation training in enhancing sexual performance and reducing psychological distress among the partners of pregnant women.

**Methods:** A quasi-experimental design with pretest-posttest measures was implemented, involving experimental and control groups. The study population consisted of husbands of pregnant women attending gynecology clinics in Tehran in 2023. A purposive sampling method selected 30 individuals, divided equally into two groups of 15 members each. Data were analysed with multivariate analysis of covariance (MANCOVA) to compare post-intervention outcomes while adjusting for baseline scores.

**Results:** Data were collected using the Male Sexual Function Questionnaire (Rosen et al., 1997) and the Psychological Distress Questionnaire (Kessler et al., 2003). The experimental group received emotion regulation training over eight one-hour sessions based on Gross's model, while the control group did not receive this intervention. Results indicated that the emotion regulation training program effectively reduced psychological distress scores and improved sexual function in post-test assessments.

**Conclusion:** Emotion regulation training, based on Gross's model, appears to be a cost-effective and non-pharmacological intervention that significantly enhances emotional-behavioral functions and sexual performance for both women and men.

### 1. Introduction

Marriage ranks among the most influential unions in life, providing a stable context that allows individuals to survive turmoil and promote self-growth (Grover & Helliwell, 2019). The more recent studies also indicate that marital relationships facilitate mental health and sexual satisfaction partly by shared emotion-regulation processes (Dubé et al., 2019; Fischer et al., 2024; Haase, 2023; Zhai et al., 2024).

One of the primary objectives of marriage is procreation, making pregnancy a common phase that many young couples experience in their marital life. Pregnancy is among the most sensitive periods for couples. Sexual function during pregnancy is affected by physical and emotional changes, as well as misconceptions and a lack of understanding about these changes. Often, the reduction or unjustified

\*Corresponding Author:

Marzie Hashemi

Address: Department of Psychology and Education, Faculty of Humanities, Khatam University, Tehran, Iran.

E-mail: [m.hashemi2@khatam.ac.ir](mailto:m.hashemi2@khatam.ac.ir)



discontinuation of sexual activity can decrease emotional and affectionate communication from the spouse, leading to anxiety and a lack of confidence in the mother (Mokaberinejad et al., 2014).

One of the things that affects the husbands of pregnant women is their sexual function. Sexual function is a complex construct that encompasses desire, physiological arousal (e.g., erections), orgasm, and subjective satisfaction and, in the World Health Organization's positive sexual health definition, is regarded as an integrated measure of physical, emotional, mental, and relational well-being rather than absence of dysfunction (WHO, 2020). A meta-analysis of 63 studies sponsored by the WHO concluded that enhanced sexual functioning is invariably linked with decreased depression and anxiety as well as enhanced life satisfaction for both genders, highlighting its public-health significance (Vasconcelos et al., 2024). In research based on an indirect question asked of pregnant women about their husbands' difficulties, it was found that fears of harming the mother or fetus led to reduced sexual contact in men towards the end of pregnancy (Tabande et al., 2016). Most partners of pregnant women experience a decline in sexual desire and performance, attributed to the woman's physical changes, fears of harming the fetus, beliefs about the immorality of sexual activity during pregnancy, and stress associated with impending fatherhood (Fernández-Carrasco et al., 2024; Read, 2004; Shahhosseini et al., 2018; Tabande et al., 2016). In some studies, men have their first sexual encounter outside the family setting during their wife's pregnancy (Lawoyin & Larsen, 2002). Characteristics of the pregnancy period may lead to psychological distress in couples (Behbahani Mandizadeh & Homaei, 2020; Nicoloso-SantaBarbara et al., 2017). Psychological distress is a term that encompasses general psychological harm, characterized by symptoms of depression, anxiety, and perceived stress (Kawa & Shafi, 2015).

Psychological distress represents a unique and distressing emotional state in response to a specific stressor or need, leading to either transient or permanent harm to the individual (GOLCHIN et al., 2021). Unlike a psychological disorder, which refers to clinical diagnostic categories, psychological distress indicates a nonspecific level of psychopathology and is defined as an abnormal emotional response to stressors (Ridner, 2004). It is one of the diagnostic signs that, when accompanied by other features, meet the diagnostic criteria for a psychological disorder (Kawa & Shafi, 2015).

Therefore, while less severe than a psychological disorder, psychological distress can interfere with various aspects of individual functioning. Previous research shows that psychological distress can significantly impact interpersonal relationships, as affected individuals

experience increased tension with spouses, children, and friends (Nicoloso-SantaBarbara et al., 2017). As mentioned, marriage is an evolving, voluntary, committed, and intimate relationship, undergoing significant physical and psychological changes during pregnancy and postpartum. Given the increasing rates of marital dissatisfaction, many couples today, after experiencing love and commitment, are seeking support that relies on creating a successful, intimate, and satisfying lifelong marital life (Momeni et al., 2021).

In the context of marital life, counseling and psychological therapies can serve as vital supports for couples aiming to achieve a good, stable marriage characterized by intimacy, commitment, and satisfaction (Hosseini & Aghababaei Talkhouncheh, 2018). Among the treatments that can enhance marital satisfaction and quality of life is emotion regulation training based on Gross's model (Valipoursheikhi & Mirederikvand, 2019). Emotions play a crucial role in various life domains, such as adapting to life changes and stressful events. Complementing these findings, research by Mohammadpanah Ardakan et al. (2022) demonstrated that while family-centered education based on the Islamic-Iranian model significantly improved family adaptability among the wives of individuals with substance dependence, it did not yield a statistically significant improvement in their emotion regulation. This suggests that while culturally grounded family interventions may strengthen structural resilience within the family unit, they may need to be supplemented with targeted emotional skills training to effectively address emotional dysregulation.

Emotions can generally be described as biological reactions to situations perceived as significant or challenging, and these biological responses are accompanied by reactions to environmental events (Garnefski et al., 2002). Although emotions have a biological foundation, individuals can influence how these emotions are expressed. The skills involved in managing these expressions are known as emotion regulation, which are internal and external processes responsible for controlling, evaluating, and modifying an individual's emotional responses to achieve their goals (Momeni et al., 2021).

Research in psychology indicates that emotion regulation is a critical factor in determining health and successful performance in social interactions (Mega et al., 2014; Sattari et al., 2016). Difficulties in emotion regulation underlie most personal distress and are common across the spectrum of psychological disorders from neuroses to psychoses. As individuals leverage and at times suffer from their emotional repertoire, unregulated emotions are associated with significant psychological distress and are said to predispose individuals to risky behaviors (Mariana K Falconier et al., 2023).

According to Gross's model (2007), emotion regulation encompasses all conscious and unconscious strategies used to increase, maintain, or decrease the emotional, behavioral, and cognitive components of an emotional response. Gross's emotion regulation process model includes five steps, each consisting of adaptive and maladaptive strategies. Particularly, individuals with emotional difficulties tend to use maladaptive strategies (such as rumination, worry, and avoidance). Thus, interventions in emotional problems involve correcting or eliminating maladaptive strategies and teaching adaptive strategies. The stages of modifying emotion regulation strategies according to Gross's model include: situation selection, situation modification, attentional deployment, cognitive change, and response modulation. Gross's process model refers to processes that either prevent the initiation of emotions or inhibit their expression after initiation (Momeni et al., 2021). Studies such as those by (Hosseini & Aghababaei Talkhouncheh, 2018; Khorshidi Mianaie et al., 2023; Rubin-Falcone et al., 2018; Taghipuor et al., 2020; Worden et al., 2019) have shown that this type of training can regulate emotions, reduce stress and anxiety levels, and address psychological issues. Additionally (Amini et al., 2021; Babazadeh et al., 2012; Fischer et al., 2024; Haase, 2023; Najafi et al., 2020) have demonstrated that emotion regulation training improves sexual function and enhances life quality. Research by (Boyes et al., 2016; Dubé et al., 2019; Gökdağ, 2021) indicated that emotion regulation skills reduce psychological distress in participants. Given the increasing issues among pregnant couples and the importance, characteristics, and complications of pregnancy in society, and considering that no study in the country has previously been conducted on the effectiveness of emotion regulation training for the spouses of pregnant women, this research was designed and implemented with the objective of determining the effectiveness of emotion regulation training on improving sexual function and alleviating psychological distress among these spouses.

## 2. Materials and Methods

This study was conducted as a quasi-experimental research with a pretest-posttest design, involving both experimental and control groups. The target population consisted of all married men whose wives were pregnant and who visited gynecology clinics and offices throughout Tehran in 2023. Using purposive sampling and based on specific inclusion criteria, 30 male participants were selected and equally divided into two groups: 15 in the experimental group and 15 in the control group. Inclusion Criteria: Experiencing their wife's first

pregnancy, Wife's pregnancy between the third and sixth months, Singleton pregnancy, Planned pregnancy, Age of spouses between 22 and 48 years, Educational level of at least a high school diploma, No immediate plans for separation and no significant physical distance between the couple, No history of major physical illnesses (e.g., diabetes, major thalassemia, heart disease) or diagnosed psychological disorders by a psychiatrist or psychologist, No substance dependence, Non-participation in other psychological training sessions. Exclusion Criteria: Missing more than two training sessions, Expressing a desire to discontinue participation in the study.

### Instruments

**The International Index of Erectile Function (IIEF):** This questionnaire, developed and validated by Rosen et al. in 1997, is designed to assess the sexual performance of men. The IIEF-15 contains 15 items scored 0–5, except items 11–14 (1–5). Five domain sums are produced: erectile function (items 1–5, 15), intercourse satisfaction (6–8), orgasmic function (9–10), sexual desire (11–12) and overall satisfaction (13–14). Domain scores are added to a total range of 2–75; higher scores denote better sexual function. Erectile-function severity is classified as severe  $\leq 10$ , moderate 11–16, mild–moderate 17–21, mild 22–25, and no dysfunction 26–30. The reliability of the various sections has been reported with coefficients ranging from 0.74 to 0.87, and the internal consistency based on Cronbach's alpha is noted as 0.85. The validity of the questionnaire has been confirmed through factor analysis (Rosen et al., 1997). In Iran, the psychometric properties of this questionnaire have also been examined (Babazadeh et al., 2020). Persian validations report  $\alpha = .92$  and ICC = .88 in community and clinical samples (Pakpour et al., 2014). Cronbach's  $\alpha$  in the present study was .88.

**Kessler Psychological Distress Scale:** This questionnaire is designed to identify mental disorders within the general population and was developed by (Kessler, 2003). It is available in two versions: one with 10 items and another with 6 items. This scale measures three components: educational presence, social presence, and cognitive presence. Items are scored on a 5-point Likert scale ranging from 0 ("never") to 4 ("always"). Items are rated 0 ("none of the time") to 4 ("all of the time") and summed (0–40); scores of 0–5 = well, 6–11 = mild, 12–19 = moderate,  $\geq 20$  = severe distress. Confirmatory factor analysis has validated the unidimensionality of this questionnaire, with factor loadings for the primary factor ranging from 0.65 to 0.84. The sensitivity, specificity, and overall classification error for the best cutoff point of the psychological distress scale, which is 8, were found to be 81%, 80.5%, and 16.5%, respectively. Furthermore, the cutoff point for

maximum sensitivity (100%) is a score of 1, and for maximum specificity (100%), a score of 27. The Cronbach's alpha coefficient was 0.93, and the Spearman-Brown reliability coefficient was 0.91 (Salehi et al., 2023). Cronbach's alpha in the current sample reached .93.

The experimental group received emotion regulation training from an experienced psychotherapist over eight group sessions, held twice weekly, each lasting one hour, following the Gross (2002) emotion regulation protocol. The control group did not receive any psychological interventions during this period. Before the

commencement of the study, written informed consent was obtained from all participants, and the pre-test phase was conducted using the designated research instruments. The post-test was carried out one week after the end of the training program. The content of the emotion regulation training sessions is summarized in Table 1.

Data were analyzed using descriptive statistics and multivariate analysis of covariance (MANCOVA) with SPSS software, version 26. Assumptions of the covariance analysis were examined and confirmed before the analysis. A significance level of 0.05 was adopted.

**Table 1. Summary of Content for Emotion Regulation Training Sessions Based on Gross's Model**

Session	Objective/Content
First	Introduction of group members to each other, explanation of the intervention logic, stages, and rules for group participation
Second	Understanding emotions and their triggers through education on the differences in emotional responses and their short-term and long-term effects
Third	Assessment of vulnerability and emotional skills of members
Fourth	Modifying the emotion-provoking situation and teaching interpersonal skills (communication, assertiveness, conflict resolution, and expressing needs)
Fifth	Shifting attention and stopping rumination and psychological turmoil
Sixth	Changing cognitive assessments and teaching re-appraisal strategies
Seventh	Modifying behavioral and physiological outcomes of emotions
Eighth	Reevaluation and addressing application barriers
Eighth	Evaluation and application problem solving

### 3. Results

Participant ages ranged from 22 to 48 years. The experimental group had a mean  $\pm$  SD age of  $37.49 \pm 5.13$  yr (median = 38), and the control group had  $36.51 \pm 4.86$  yr (median = 37). Chi-square tests regarding educational level, marital status, and employment indicated no significant differences between the

experimental and control groups ( $P > 0.05$ ). Table 2 presents the means and standard deviations of the dependent variables, including sexual function and psychological distress. Results indicated that the mean scores for sexual performance and psychological distress in the post-test were improved in the experimental group compared to the control group.

**Table 2. Means and Standard Deviations of Dependent Variables by Group and Measurement Stages**

Dependent Variable	Group	Count	Pre-test Mean $\pm$ SD	Post-test Mean $\pm$ SD
Sexual Function	Experiment	15	$6.61 \pm 0.48$	$6.89 \pm 0.54$
	Control	15	$6.87 \pm 0.49$	$6.07 \pm 0.50$
Psychological Distress	Experiment	15	$4.12 \pm 0.23$	$5.25 \pm 0.17$
	Control	15	$3.62 \pm 0.24$	$3.34 \pm 0.23$

For the covariance analysis, assumptions such as normality of distribution, homogeneity of regression slopes, multiple correlations of dependent variables, and homogeneity of variance-covariance matrices were verified. The Kolmogorov-Smirnov test confirmed the normal distribution of data for dependent variables ( $P > 0.05$ ). The test for homogeneity of regression slopes indicated no significant interaction between pre-test and group (intervention and control) for dependent variables (post-test), thereby affirming homogeneity of slopes. The multiple correlation assumption among dependent variables was assessed using Mauchly's test of sphericity. The homogeneity of variance-covariance

matrices was verified using Box's M test (Box's  $M = 2.314$ ,  $F = 0.138$ ,  $P > 0.297$ ). Thus, with all the previous assumptions confirmed, all necessary conditions for performing MANCOVA were met.

Kolmogorov-Smirnov tests indicated no significant departure from normality for either dependent variable—sexual function ( $p = .200$ ) and psychological distress ( $p = .200$ ). Levene's test confirmed equality of error variances across groups for sexual function,  $F(1, 28) = 3.45$ ,  $p = .074$ , and psychological distress,  $F(1, 28) = 3.27$ ,  $p = .081$ . Therefore, the normality and homoscedasticity assumptions required for the subsequent MANCOVA were satisfied.

**Table 3. Results of Multivariate Analysis of Covariance on Dependent Variables**

Test Type	Value	F-statistic	Hypothesis df	Error df	P-value	Effect Size	Statistical Power
<b>Pillai's Trace</b>	0.871	84.55	2	25	0.001	0.87	1.00
<b>Wilks' Lambda</b>	0.129	84.55	2	25	0.001	0.87	1.00
<b>Hotelling's Trace</b>	6.76	84.55	2	25	0.001	0.87	1.00
<b>Greatest Root</b>	6.76	84.55	2	25	0.001	0.98	1.00

The results of the four tests (Pillai's Trace, Wilks' Lambda, Hotelling's Trace, Greatest Root) used in multivariate analysis of covariance were statistically significant ( $F = 84.55$ ,  $P = 0.001$ , Effect Size = 0.87), indicating that the null hypothesis was rejected. It was determined that the linear combination of dependent variables—post-test scores of sexual function and psychological distress—was significantly influenced by the independent variable (emotion regulation training based on Gross's model), after adjusting for covariates (pre-test scores of sexual function and psychological

distress). Therefore, the experimental group differed significantly from the control group in at least one of the study variables at post-test. The eta-squared was approximately 87%, indicating that 87% of the variance in post-test scores for sexual performance and psychological distress in men with pregnant wives was accounted for by participation in the emotion regulation training sessions. The statistical power of 1.000 suggests sufficient sample size accuracy for testing this type of educational and interventional program (Table 4).

**Table 4. Analysis of Covariance Results on the Impact of Emotion Regulation Training on Dependent Variables at Post-Test**

Dependent Variable	Sum of Squares	df	Mean Squares	F	P-value	Effect Size	Statistical Power
<b>Sexual Function</b>	224.62	1	224.62	54.54	0.001	0.67	1.00
<b>Psychological Distress</b>	141.4	1	141.4	118.64	0.001	0.82	1.00

#### 4. Discussion and Conclusion

This study was conducted to evaluate the effectiveness of emotion regulation training on improving sexual function and psychological distress among the spouses of pregnant women. The primary finding from this study demonstrated that participation in emotion regulation training sessions based on Gross's model significantly enhanced the sexual performance of these spouses at post-test. This outcome indirectly aligns with the results of previous studies such as those by (Babazadeh et al., 2020; Besharat et al., 2018; Fischer et al., 2022; Hatzenbuehler et al., 2008; Najafi et al., 2020; Tull et al., 2012).

Given the confirmation of the impact of emotion regulation training on improving sexual performance in spouses of pregnant women, it can be stated that emotion regulation training has effectively enhanced sexual function in the experimental group compared to the control group. Sexual function is a multidimensional phenomenon influenced by various biological, psychological, and social factors (Brotto et al., 2016). During pregnancy, it experiences deficiencies that can be attributed to factors such as misconceived beliefs about the immorality of sexual relations, changes in self-body image, reduced feelings of attractiveness to the spouse, fear of harm to the fetus, and potential miscarriage (Fernández-Carrasco et al., 2024; Read, 2004; Shahhosseini et al., 2018; Tabande et al., 2016). In line with the first hypothesis, the husbands who received Gross-based emotion-regulation training displayed significantly better sexual functioning at post-

test. Converging evidence further shows that maladaptive emotion-regulation strategies -rumination, catastrophising, experiential avoidance - magnify psychological distress and erode couple intimacy (Mariana K. Falconier et al., 2023; Garnefski & Kraaij, 2007; Gross, 2013). Conversely, programmes that teach adaptive strategies such as cognitive re-appraisal and mindful attention yield improvements in mood, relationship quality, and sexual satisfaction (Dubé et al., 2019; Haase, 2023).

Emotions play a critical role in an individual's external behaviors. Theories of emotion emphasize the importance of emotions in eliciting motor, physiological, and behavioral responses, facilitating decision-making processes, enhancing memory, and fostering interpersonal interactions. Additionally, emotion regulation training involves reducing and controlling negative emotions and utilizing positive emotions constructively (Engen & Anderson, 2018). This training leads to increased positive and pleasant behaviors and alters the feelings and behaviors of couples, ultimately enhancing intimacy and reducing marital conflicts during pregnancy. This can significantly impact the emotional connection, time spent together, and sexual performance.

Consistent with the second hypothesis, emotion-regulation training produced a pronounced reduction in psychological distress. According to the finding of this study, participating in emotion regulation training sessions based on Gross's model led to improvements in psychological distress among the spouses of pregnant

women. This outcome is consistent with prior research, such as that conducted by (Beirami et al., 2014; Gökdağ, 2021; Salehi, 2023). One of the primary purposes of marriage is procreation, making pregnancy a particularly sensitive period that many young couples experience. Sexual performance during pregnancy is influenced by physical and emotional changes, as well as by beliefs and misconceptions. Misunderstandings about these changes can lead to a reduction or unjustified discontinuation of sexual activity, decreasing affectionate communication from the spouse, thereby causing anxiety and a lack of self-confidence in the mother (Beirami et al., 2014).

The characteristics of pregnancy can potentially lead to psychological distress among couples (Behbahani Mandizadeh & Homaei, 2020; Nicoloro-SantaBarbara et al., 2017). Given the confirmed impact of emotion regulation training on psychological distress in spouses of pregnant women, it is evident that this training significantly improved psychological distress in the experimental group compared to the control group. Emotion regulation training, by making individuals aware of their emotions, accepting and appropriately expressing them, plays a vital role in reducing psychological distress. High levels of positive emotions and the reduction of negative emotions significantly influence one's self-perception and judgment, thus encompassing numerous regulatory processes and strategies that include cognitive, physical, social, and behavioral dimensions. Strategies such as reappraisal, rumination, self-expression, avoidance, and inhibition are involved. Therefore, emotion regulation, particularly the strategy of cognitive reappraisal of emotions, reduces negative feelings and increases positive feelings and adaptive behavior. Consequently, emotion regulation training helps individuals to properly use their emotions, enhancing awareness, acceptance, and expression, especially of positive emotions in various life situations, thereby reducing their negative feelings and consequently decreasing their psychological distress.

This study, like others in the field of behavioral and social sciences, faced several limitations such as, the absence of a follow-up period, the selection of a non-random and purposive sample of married men with pregnant wives, and the lack of control over intervening variables, and overlooking other possible psychological-emotional syndromes concurrent with psychological distress. Since spouses of pregnant women show higher vulnerability to unmet emotional

and marital needs during pregnancy, this factor could have influenced the results. Therefore, the generalizability of the findings should be approached with caution. It is recommended that the effectiveness of this type of intervention and educational program be studied in men and women at other life stages and compared with other psychological programs.

This quasi-experiment validates the efficacy of emotion regulation training in line with Gross's theory in improving sexual functioning and reducing psychological distress among pregnant women's partners. The existence of significant differences between experimental and control groups' post-tests demonstrates the beneficial effect of this training. The result suggests that its implementation within counseling programs for expectant fathers is likely to play an important role in their health and interpersonal relations.

## 5. Ethical Considerations

### Compliance with ethical guidelines

This study adhered to ethical considerations in both its execution and documentation phases. Privacy and confidentiality of the collected data were maintained, with the information being used solely for this research. Respect for the dignity and privacy rights of participants was prioritized, including clear explanations of the study's goals, obtaining informed consent, voluntary participation, the right to withdraw from the study without any detriment, answering participants' queries, and offering to share the results with participants if desired.

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### Authors' contributions

All authors contributed to the design, implementation, and writing of all parts of the article.

### Conflicts of interest

According to the authors, this article has no financial support and no conflicts of interest.

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