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The effect of educational intervention based on self-efficacy theory on pregnancy anxiety and childbirth outcomes among Iranian primiparous women

Narges Gandomi^{1,2}, Gholamreza Sharifzadeh³, Marzieh Torshizi⁴, Ensiyeh Norozi¹

Abstract:

BACKGROUND: Pregnancy anxiety is associated with a diverse birth outcomes. Mothers' education could have a critical role in increasing their self-efficacy to defeat their anxiety and improve pregnancy and child birth outcomes. The study was conducted to examine the effect of intervention based on self-efficacy theory on pregnancy anxiety and child birth outcomes.

MATERIALS AND METHODS: The study was conducted as a quasi-experimental design on 60 primiparous women (26–28 weeks) in Birjand (East Iranian province) from May to September 2017, who were randomly divided into intervention and control groups. The intervention group received 8 sessions of 90-min educational intervention based on self-efficacy theory strategies besides the routine prenatal care. Vanden Bergh's pregnancy anxiety questionnaire and checklist of pregnancy and delivery outcomes were used for data collection.

RESULTS: The level of pregnancy anxiety was similar in both groups before the intervention, but immediately and 1 month after the intervention, the mean score of pregnancy anxiety significantly reduced in the intervention group and significantly increased in the control group ($P < 0.001$). There was a significant difference in mean neonatal weight ($P < 0.001$) between the two groups. Emergency and elective cesarean section were significantly lower in the intervention group compared to the control group ($P < 0.001$), but there were no significant differences in the frequency of preterm delivery between two groups ($P < 0.05$).

CONCLUSION: The results provide support for the effectiveness of intervention based on self-efficacy theory in reducing pregnancy anxiety and enhancing positive pregnancy outcomes. Hence, theory-based educational interventions may serve as a cost-effective and noninvasive approach to reduce pregnancy anxiety in Iran.

Keywords:

Anxiety, education, pregnancy, pregnancy outcome, self-efficacy

Introduction

Pregnancy anxiety refers to concerns, mental occupations, and individual's fears of pregnancy, child birth, infant health, and future parenting.^[1] Different studies indicate that a significant percentage of women experience pregnancy anxiety in their pregnancy.^[2-4] For

instance, the results of a longitudinal study on 500 Indian pregnant women showed that pregnant women experience different levels of pregnancy anxiety throughout pregnancy, with the highest pregnancy anxiety reported in the third trimester of pregnancy and almost all women examined (99%) experienced moderate-to-severe pregnancy anxiety in the

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Address for correspondence:
Dr. Ensiyeh Norozi,
Department of
Public Health, Social
Determinants of Health
Research Center,
Faculty of Health, Birjand
University of Medical
Sciences, Birjand, Iran.
E-mail: noroziensiyeh@yahoo.com

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third trimester of their pregnancy.^[3] Moreover, the results of different studies on Iranian pregnant women indicated that they experience moderate –to –severe levels of anxiety during pregnancy.^[5-7]

The results of several studies show a close and significant relationship between pregnancy anxiety and adverse pregnancy outcomes such as preterm labor, low birth weight, and cesarean section delivery.^[8-11] For instance, according to the results of a study by Ding *et al.*, pregnancy anxiety was associated with preterm labor and low birth weight.^[8] However, the results of some studies show no significant relationship between pregnancy anxiety and pregnancy outcomes.^[1,12] Indeed, the results of a review study by Andersson *et al.* indicated that the main cause of midwifery complications is an increase in the level of the hormone in the uterus that may be triggered by anxiety; however, there is generally no relationship between anxiety and midwifery complications. Nonetheless, certain types of anxiety like psychological stress, lack of family support, and fear of child birth are connected to complications such as prolonged labor and cesarean section, and anxiety may affect midwifery complications as an indirect agent.^[12]

According to different studies, one of the factors that affect pregnancy anxiety and fear of child birth is women's perceived self-efficacy for adapting to physiological and emotional changes and challenges of pregnancy and childbirth.^[13-15] Salomonsson states that women with high levels of anxiety focus on their inability to perform these tasks rather than their duties. Indeed, emotional arousal is an important source of self-efficacy perceptions, and emotional responses such as fear and anxiety can reduce self-efficacy.^[15] As perceived low self-efficacy is associated with increased fear of childbirth, increased perception of pain during delivery, and increased gynecological interventions, enhancing women's perceived self-efficacy in their abilities in coping with changes and physiological and emotional pregnancy challenges are vital in making women ready for delivery.^[16] One of the low-cost and effective strategies for promoting perceived self-efficacy of pregnant women and reducing pregnancy anxiety is designing and implementing different educational interventions.^[16-19] Thus, given the lack of studies in Iran concerning the effect of theory-based interventions on pregnancy anxiety and pregnancy outcomes, the study was conducted to examine the effect of educational intervention based on self-efficacy theory on pregnancy anxiety and pregnancy and delivery outcomes.

Materials and Methods

Study design and setting

The study was a quasi-experimental research conducted on 60 primiparous women in Birjand (east Iranian province) from May to September 2017.

Study participants and sampling

The population was all primiparous mothers who admitted to comprehensive health service centers who were in 26–28 weeks of pregnancy and had no history of prenatal education. Inclusion criteria were single pregnancy, not having high-risk pregnancies (placenta previa, preeclampsia, and preterm labor), no consumption of anti depressant and anxiety medication, not having psychiatrist history, no prohibition on natural childbirth, and having literacy for reading and writing. Exclusion criteria were unwillingness to participate in the study, lack of regular attendance at training sessions (a least two absences during training sessions), pregnancy problems such as preterm labor, postpartum, and happening of severe psychological trauma to women during the intervention such as losing a loved one. Sample size was estimated 27 patients in each group according to the results of Malekpour – Afshar *et al.* (based on the results of changes in anxiety scores in before and 3 months after the intervention; $S1 = 1$, $S2 = 2.2$, and $d = 1.5$).^[20] but a ample size of 30 was considered in each group to increase the accuracy and considering the possibility of selecting a larger sample size.

Procedure

After the plan was approved by the Ethics Committee of Birjand University of Medical Sciences, one of the comprehensive health service centers of Birjand was randomly selected. Then, from among the health bases covered by the center, two health bases were randomly selected with one randomly assigned to the intervention group and the other to the control group. Then, in each health base, the list of pregnant women eligible for inclusion in the study was extracted from the registration system of pregnant women, and from this extracted list, 30 individuals were randomly listed as in each group (control and intervention). It should be noted that to comply with ethical considerations, by phone contact with the selected samples, the objectives of the study and the overall structure of the educational intervention were explained to them, and after receiving the verbal consent of the target group to participate in the study, they were asked to participate at the meeting to learn more about the program and obtaining written consent. Besides obtaining written consent, the questionnaires were completed in this session (Vanden Bergh pregnancy anxiety questionnaire, demographic information, and pregnancy background). Moreover, the program framework, which included a detailed explanation of the structure of the sessions, was given to the target group.

Data collection tool and technique

Vanden Bergh pregnancy anxiety questionnaire, demographic information form (age, education, occupation, spouse occupation, gestational age, and duration of marriage), and check list of information on

pregnancy and delivery outcomes (neonatal weight, gestational age, and delivery type) were used to collect data.

Pregnancy-related anxiety questionnaire

It deals with evaluating concerns and fears during pregnancy and was developed by Vanden Bergh in 1989. The questionnaire has 58 items that evaluate 5 factors: fear of delivery (14items), fear of giving birth to a child with physical or mental problems (5items), fear of change in marital relationships (13items), fear of changes in mood and its effects on the child (16items), self-centered fears, or fear of changes in the mother’s personal life (7items). Questionnaire scoring is obtained by summing up the scores of each item from 0 to 7.^[21]The validity and reliability of the questionnaire have been confirmed among Iranian pregnant women.^[22] As the last three items of this questionnaire are general and provide an overview of pregnancy, they were not included in the analysis.

Educational intervention framework

Educational intervention was conducted for the intervention group during 8training sessions (2 sessions per week for 90 min). To increase interaction between the trainer and thetarget group, the individuals were divided into groups of 7–8 and training sessions were held among these small groups. The educator was a midwife and a master of health education and health promotion. The contents and the framework of the sessions are reported in Table 1.

The strategies mentioned below were used to enhance the perceived self-efficacy of pregnant women to overcome pregnancy anxiety. These strategies are based on Bandura’s theory of self-efficacy: ^[23]

1. Increasing awareness of pregnant mothers: Familiarity with the reproductive system, prenatal care, natural delivery mechanism, methods of reducing labor pain, benefits of natural delivery and breastfeeding, post partum recovery, breathing techniques, relaxation, and massage techniques
2. Increasing pregnant mothers’ self-awareness: About their fears that lead to pregnancy anxiety and about the awareness of each of the pregnant mothers about their abilities to perform natural childbirth, parenting, and breastfeeding
3. Developing mastery experiences in pregnant mothers: By providing their active participation in learning various skills (relaxation, massage, breathing patterns, and stretching exercises) through session and home practice
4. Creating vicarious experiences in pregnant mothers: By applying healthy role models in childbirth, breastfeeding, and parenting
5. Providing verbal encouragement and informative feedback: Regarding pregnant mothers performance, especially when performing various exercises
6. Creating perceived social support as bellow:
 - A. Providing emotional support by creating and strengthening the bond between pregnant mothers and their families

Table 1: Contents and structure of training sessions based on self-efficacy theory strategies

Session	Training contents	Teaching method	Self-efficacy promotion strategies
Session 1	Introducing the group members to each other State the goals of educational intervention Describing pregnancy anxiety and its consequences	Lecture, question answer, group discussion and pamphlet presentation	Increasingawareness,buildingarespectful and caring relationship, informational support
Session 2	Identify various fears and concerns of mothers Familiarizing mothers with the structure of the reproductive system expressing routine prenatal care	Lecture, question answer, group discussion, using moulage	Increasing awareness, increasing self-awareness, informational support
Session 3	Expressing the natural delivery mechanism Expressing the benefits of natural childbirth Expression labor pain relief methods	Lecture, question answer, group discussion and pamphlet presentation	Increasing self-awareness, informational and emotional support, providing verbal feedback, inviting a healthy role model, and providing vicarious experiences
Session 4	Practical exercises for relaxation, massage, and proper breathing patterns Inviting important referent individuals of mothers	Practicalshow,roleplaying, film presentation, question answer	Social support, mastery experiences, emotional support, verbal feedback
Session 5	Breastfeeding education and common breastfeeding problems Training on proper nutrition during breastfeeding	Lecture, question answer, practical show, film presentation, pamphlet presentation	Increasingawareness,masteryexperiences
Session 6	Health behaviors at postpartum recovery period Practical breastfeeding exercises and troubleshooting	Lecture, question answer, group discussion	Increasing awareness, informational support, mastery experiences
Session 7	Visits to maternity rooms and familiarizing mothers with the usual mother’s hospital admission rules	Practical visit	Increasing awareness, reducing stress, instrumental support
Session 8	A review of past issues and resolving mother’s problems	Lecture, question answer, group discussion	Promoting self-efficacy, increasing awareness, overcoming stress

*It has to be noted that relaxation sessions were done by a midwife and a master of clinical psychology and the rest of the sessions by the researcher (Bachelor of Midwifery – MSc. in health education and health promotion)

- B. Providing informational support by providing all kinds of information needed by pregnant mothers, visiting maternity hospitals and familiarity with labor and delivery rooms, as well as linking pregnant mothers with healthy role models
 - C. Providing instrumental support by providing conducive conditions for the pregnant mothers to attend classes and to coordinate the time for classes according to pregnant mothers times.
 - D. Providing evaluative support by providing feedback to the mothers, following up the home exercises, and providing the mother with access to the researcher on the questions about the issues in the classroom.
7. Reducing stress of pregnant mothers through training in relaxing exercises, massage, and proper respiratory patterns.

It has to be noted that during the 1-month follow-up period, every member in the intervention group received a training pamphlet as well as a training track, and several SMS messages were sent to all the members of intervention group and the problems of the intervention group were answered by researchers. Obviously, the control group received no training intervention.

Ethical consideration

All the procedures were approved by the Ethics Committee of Birjand University of Medical Sciences (Ir. bums.REC.1395.178). The study was described to participants and they were assured that their participation was voluntary. Written informed consent was provided by all the participants.

Data analysis

Statistical analysis was done using SPSS19 (IBM Corp. Released 2010. IBM SPSS Statistics for Windows, Version 19.0. Armonk, NY: IBM Corp.). Descriptive statistics including central and dispersion indices and frequency distribution were used to describe the data. At first, the normal distribution of data was evaluated by Kolmogorov–Smirnov test, and given the normal data distribution, repeated measures ANOVA, Bonferroni *post hoc* tests, independent *t*-test, Chi-square test, and Fisher's exact test were used. Moreover, $P < 0.05$ was considered as the significance level for all hypotheses.

Results

As shown in Table 2, there were no significant differences between demographic characteristics of the intervention and control groups ($P > 0.05$). Pregnancy anxiety level was similar in two groups prior to the intervention ($P < 0.05$). However, immediately after and 1 month after the intervention, the mean score of pregnancy anxiety

decreased significantly ($P < 0.001$) in the intervention group and increased significantly ($P < 0.001$) in the control group. The results on the comparison of pregnancy anxiety levels and their subscales in the two groups in three-time intervals examined are shown in Table 3. As Table 4 shows, there was a statistically significant difference in mean neonatal weight ($P < 0.001$) between two groups. Emergency and elective cesarean delivery were significantly lower in the intervention group compared to the control group ($P < 0.001$), with no significant differences in the frequency of preterm delivery between the two groups ($P < 0.05$) [Table 4].

Discussion

Self-efficacy is the confidence that an individual feels about performing a particular activity. This concept affects the level of effort and performance of the individual.^[24] Bandura and Locke (2003) performed a review on nine meta-analyses examining individuals' self-efficacy beliefs in various areas of behavioral performance. According to the results, self-efficacy was a strong predictor of the occurrence of coping behaviors, performance levels, and resistance to complex problems.^[25] Bandura argues that people's negative emotions such as fear, anxiety, tension, and depression make individuals underestimate their ability in dealing with challenging situations.^[25] Given all these, the purpose of the study was to determine the effect of educational intervention based on the self-efficacy theory on the anxiety of pregnant women and pregnancy outcomes among pregnant women admitted to Birjand health centers. The results showed the effect of intervention based on self-efficacy theory on reducing anxiety in mothers of the intervention group. Indeed, this intervention was reduced the fear of giving birth, the fear of child birth with physical or psychological problems, the fear of change in mood, and self-centered fear in the mothers in the intervention group. The results of other studies indicate the effectiveness of interventions based on Bandura's self-efficacy theory on reducing pregnancy anxiety perception and promoting self-efficacy among pregnant women to deal with labor pain.^[16,18]

In the present study, various strategies were used to promote women's self-efficacy to overcome fears related to pregnancy and childbirth and to reduce pregnancy anxiety. One of the causes of anxiety among pregnant women, especially primiparous mothers, is the lack of awareness and knowledge about the events during pregnancy and delivery. Thus, one of the most significant strategies used in the study to reduce pregnancy anxiety was to raise awareness of pregnant women on pregnancy anxiety and its effects on fetal and maternal health as well as familiarizing pregnant women with reproductive system, natural delivery mechanism,

Table 2: Demographic and baseline characteristics of participants at enrollment (n=60)

Characteristics	Experimental group (n=30), n (%)	Control group (n=30), n (%)	χ^2/t	P
Age, mean±SD	23/8 (3/31)	23/3 (3/60)	0/55	0/58
Gestational ages (weeks), mean±SD	27/1 (0/84)	26/9 (0/83)	0/77	0/44
Level of education				
College	12 (40)	14 (46/7)	0/28	0/87
Diploma	11 (36/7)	10 (33/3)		
High school or less	7 (23/3)	6 (20)		
Employment status				
Housewife	23 (76/7)	21 (70)	1/25	0/7 [†]
Employed	3 (10)	6 (20)		
Student	4 (13/3)	3 (10)		
Spouse level of education				
College	11 (36/7)	14 (46/7)	0/61	0/73
Diploma	12 (40)	10 (33/3)		
High school or less	7 (23/3)	6 (20)		
Spouse employment status				
Employed	29 (96.6)	30 (100)	3/44	0/17 [†]
Unemployed	1 (3/3)	0		
Income status				
Weak	2 (6/7)	1 (3/3)	0/5	1 [†]
Moderate	8 (26/7)	9 (30)		
Good	20 (66/7)	20 (66/7)		
Insurance status				
Yes	30 (100)	29 (96.6)	1	1 [†]
No	0	1 (3/3)		
Pregnancy status				
Planned pregnancy	30 (100)	26 (86.7)	0/11	0/06 [†]
Unplanned pregnancy	0	4 (13/3)		

[†]Fisher's exact test. SD=Standard deviation

benefits of natural delivery, and methods of reducing labor pain and overcoming stress. Unfortunately, women are exposed to an influx of information and advice regarding pregnancy and delivery from different sources of information, especially family members and the elderly during pregnancy, which are contradictory in many cases. On the other hand, unfortunately, nowadays, most gynecologists and health workers do not have enough time to train pregnant women and give them information, given the high number of admissions and overwork, which increases the anxiety of mothers. Thus, it looks that pregnant women have a special need for pregnancy and delivery counseling to ask questions easily and make sure they receive the right information.

Another strategy used in the study to improve mothers' perceived self-efficacy in overcoming pregnancy and delivery fears was to create good experiences in pregnant mothers by providing them with active participation in learning different skills (relaxation, massage, breathing patterns, and stretch exercises) by practice at the meeting and home. Another important strategy to improve mothers' perceived self-efficacy in overcoming pregnancy and delivery fears was to create vicarious experiences by inviting healthy role models in childbirth, breastfeeding, and parenting to

participate in training sessions and group discussions with pregnant women. As the results of some studies show the significant role of perceived social support in reducing pregnancy anxiety,^[26] we tried to establish and strengthen the bond between the pregnant mother and her family to improve the emotional support of mothers. Thus, the pregnant mothers were allowed to have a trusted companion, a friend or mother and so on in the training classes. Moreover, the wives of pregnant women were invited to attend a training session dedicated to spouses. The purpose of the session was to enhance the level of awareness and attitude of pregnant women spouses toward pregnancy and natural physical and psychological changes of this period and to enhance the spouses' perception of psychological changes in pregnant women. Moreover, to provide informational support, pregnant mothers visited the maternity and pain rooms and become familiar with the maternity environment, as well as the process of admission, hospitalization, and discharge. Another significant strategy used in the study to reduce pregnancy anxiety and mother's stress was through training in relaxation, massage, and breathing patterns. According to the results of different studies, muscle relaxation training and respiratory techniques reduce anxiety and stress among pregnant women.^[27]

Table 3: Pregnancy related anxiety questionnaire scores before and after intervention

Pregnancy related anxiety	Mean±SD		t	P
	Experimental group (n=30)	Control group (n=30)		
Fear of child birth				
Before intervention	5/48±0/66	5/42±0/51	0/41	0/68
Immediately after Intervention	2/68±0/99	5/52±0/53	13/85	<0/001
1 month after intervention	2/37±1/04	5/68±0/51	15/54	<0/001
F	152/8	3/155		
P	<0/001	0/05		
Fear of bearing a physically or mentally handicapped child				
Before intervention	5/29±0/8	5/34±0/64	0/29	0/78
Immediately after intervention	2/51±1/03	5/56±0/77	12/88	<0/001
1 month after intervention	2/22±1/18	5/8±0/81	13/69	<0/001
F	128/5	4/21		
P	<0/001	0/02		
Fear of changes in the marital relationship				
Before intervention	4/77±0/66	4/83±0/41	0/37	0/7
Immediately after intervention	2/69±0/91	5/01±0/53	12/06	<0/001
1 month after intervention	2/33±0/85	5/46±0/55	16/85	<0/001
F	91/98	16/18		
P	<0/001	<0/001		
Fear of changes in mood and its consequences on the child				
Before intervention	4/74±0/55	4/89±0/56	1/02	0/31
Immediately after intervention	2/55±0/82	4/96±0/63	12/66	<0/001
1 month after intervention	2/30±0/74	5/55±0/49	19/99	<0/001
F	154/91	19		
P	<0/001	<0/001		
Fear of the changes in personal life of mother				
Before intervention	5/11±0/75	5/15±0/54	0/19	0/84
Immediately after intervention	2/99±1/15	5/42±0/46	10/74	<0/001
1 month after intervention	2/51±1/07	5/91±0/59	15/15	<0/001
F	90/74	20/93		
P	<0/001	<0/001		
Pregnancy related anxiety total score				
Before intervention	5/03±0/45	5/90±0/29	0/61	0/55
Immediately after intervention	2/67±0/83	5/23±0/42	14/95	<0/001
1 month after intervention	2/35±0/81	5/64±0/43	19/68	<0/001
F	209/33	28/84		
P	<0/001	<0/001		

SD=Standard deviation

Table 4: Comparison of pregnancy outcomes at birth between two groups

Pregnancy outcomes	Experimental group (n=30), n (%)	Control group (n=30), n (%)	χ ² /t	P
Gestation at birth (weeks)				
Preterm birth (<37)	1 (3/3)	4 (13/3)	1/96	0/16†
Term birth (≥37)	29 (96/7)	26 (86/7)		
Mode of birth				
Normal vaginal delivery	25 (83/3)	11 (36/7)	13/50	0/003†
Selective cesarean section	1 (3/3)	5 (16/7)		
Emergency cesarean section	4 (13/3)	12 (40)		
Instrumental delivery	0	2 (6/7)		
Birth weight, mean±SD	3308±386/7	2934±431/40	3/53	0/001

†Fisher's exact test. SD=Standard deviation

The results of the study showed that the weight of the infants of the mothers in the intervention group was significantly higher than that of the infants in control group. The mean neonatal weight in the intervention

group was 3308 g and 2934 g in the control group. Low birth weight is one of the most critical public health problems around the world with many short-term and long-term consequences on children's health.^[28] Some

of the significant consequences are increased fetal and neonatal mortality, neurological and developmental problems, and increased risk of chronic disease later in life.^[29] According to the World Health Organization statistics, about 15%–20% of births in the world have low birth weight, equivalent to more than 20 million births annually.^[28] Significant births of low-birth-weight infants occur in low-and middle-income countries.^[29] In doing so, it is necessary to identify the factors that influence low birth weight and design interventions to enhance birth weight status. According to the results of some studies, one of the factors that influence birth weight is pregnancy anxiety.^[8,10] The results of the present study showed the effect of intervention based on the self-efficacy theory on reducing the anxiety of pregnant mothers and improving weight gain in intervention group mothers compared to the control group.

Moreover, according to the results of the study, there was a significant difference in delivery type (cesarean section and normal delivery) between the intervention and control groups. Indeed, the normal delivery was more prevalent in the intervention group compared to the control. This could show the effect of the intervention based on self-efficacy theory on reducing women's fear of natural child birth. According to some studies, the fear of delivery increases women's demand for cesarean section and thus the rate of elective cesarean section.^[30-32] Fear of delivery is more severe in primiparous women than in multiparous women.^[3] According to the other studies, a pregnant woman experiencing more delivery fear in the third trimester for any reason increases cesarean section probability. Indeed, even if pregnant women are physically healthy, the demand for abortion or cesarean section is the only way to avoid fear in women with fear.^[12] The results of the present study showed no significant differences in preterm delivery between the intervention and control groups. In a meta-analysis study entitled, "The relationship between pregnancy anxiety and neonatal outcomes" by reviewing 256 studies, Littleton *et al.* (2007) reported no significant relationships between anxiety symptoms in pregnancy and preterm labor.^[1]

As maternal anxiety during pregnancy has negative effects on fetal and neonatal health, planning for providing psychological services and care to pregnant mothers is necessary. Based on the results of the study stating the effectiveness of an educational intervention based on self-efficacy theory in the reduction of pregnancy anxiety and as education is one of the key elements of healthcare, more attention has to be paid to designing and planning educational interventions in Iran to reduce pregnancy anxiety. Here, learning from other countries' programs could prove helpful. For instance, special attention has been paid to pregnancy anxiety and

fear of delivery in Sweden in recent years, and specialized teams to support women in delivery are deployed in all of obstetrics and gynecology sections nowadays. The members of these teams include experienced midwives supported by obstetricians, psychologists, social workers, and sometimes psychiatrists. These services are accessible to most women.^[2]

Limitations

Ultimately, one has to note some of the most important limitations of the study. One of the major limitations of the study was a large number of questions in the questionnaire that caused fatigue in women. The other limitation was the effect of individual and personality differences of the pregnant women on their level of anxiety. However, it was tried to control this effect to some extent by the random allocation of the groups. Finally, the study attempted to control the effect of major events on anxiety, but the small stresses of daily life that cause anxiety could not be measured.

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Conflicts of interest

There are no conflicts of interest.

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