Article

JHP

Journal of Health Psychology
1–6

DOI: 10.1177/1359105315589800
hpq.sagepub.com
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The effects of stress inoculation training on perceived stress in pregnant women

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Abstract

A total of 64 pregnant women were assigned into two groups of cases and controls. Both groups filled out the Perceived Stress Scale at pre-test. Cognitive-behavioral coping skill training was delivered to the case group. After the end of the intervention, both groups completed the same scale again. The results showed that the mean perceived stress of the cases and controls was 27.77 ± 6.033 and 18.97 ± 3.268, respectively (p = 0.001). Therefore, midwives are recommended to plan educational interventions to decrease perceived stress in pregnant women.

Keywords

cognitive-behavioral method, pregnancy, prenatal education, stress

Introduction

Perceived stress is defined as the degree of stress an individual feels and the level of unpredictability and uncontrollability he or she perceives in life. Perceived stress in pregnant women is the extent to which they regard their resources to cope with various life experiences and threatening situations as insufficient (Cohen et al., 1983). The perception of stress affects health and elevates the risk of premature death by 43 percent (Keller et al., 2012). Stress during pregnancy has also been proven to cause serious complications in both the mother and the fetus (Lobel et al., 2008; Nkansah-Amankra et al., 2010; Westerneng et al., 2015). Stress increases labor pain through releasing catecholamines and keeping the myometrium in its non-functional state. This will in turn lead to prolonged and ineffective pains (Valero De Bernabé et al., 2004). In addition, psychological stress during pregnancy, delivery, and lactation can result in undesirable outcomes such as abortion, nausea and vomiting, pre-eclampsia, weight loss, pre-term delivery, and low birth weight (Hobel and Culhane, 2003; Sabuncuoglu and Basgul, 2014). Studies have reported higher

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perceived stress to be correlated with younger age, being single/divorced/separated, low level of education, working long hours, unplanned pregnancy, and poor maternity care environment (Jomeen and Martin, 2008; Lau and Yin, 2011). Meanwhile, pregnant women's perceived stress and thus labor pains can be controlled through non-medical psychological methods such as muscular relaxation techniques (Bastani et al., 2005; O'Donohue et al., 2003).

Meichenbaum (1993) developed stress inoculation training (SIT) as a cognitive-behavioral approach to cope with various stressors. SIT involves a broad range of activities including conceptualization, relaxation, problem-solving, and cognitive-behavioral exercises and techniques. Such cognitive-behavioral approaches not only provide individuals with effective techniques to rely on in stressful events but also boost their power to tackle future stressful events and prevent the feeling of drowning when facing stress (Jessop et al., 2014; Khorsandi et al., 2013). Since a few studies have prospectively evaluated the effects of stress management interventions on adjusting the levels of stress in pregnant women and their infants, the present research examined the efficacy of SIT in reducing perceived stress in Iranian pregnant women.

Methods

Participants

This interventional study applied randomized sampling to select 64 pregnant women (in two groups of case and control) from women presenting at health centers of Borujerd (Iran). The study protocol was approved by the Research Committee of Azad University of Arak, Iran (registration number: 12120706882006) and all subjects signed informed consent forms prior to participation. The inclusion criteria were literacy (being able to read and comprehend the stages of relaxation from the pamphlet), being primigravid, gestational age between 18 and 32 weeks, and low-risk pregnancy. Women with a history of psychiatric disorders or treatment, a history of addiction (e.g. cigarette, opium, and opioids), and an alcohol abuse habit were not included. The exclusion criteria were developing any disease or hospitalization for any reason during the intervention period and lack of active and regular participation in the training stages of the intervention (relaxation) in the case group. Random selection and allocation of the subjects ensured the absence of significant differences in other factors (e.g. demographic factors) between groups.

Materials

The Perceived Stress Scale (PSS), developed by Cohen et al. (1983), was used in this study. The PSS is regarded as a global measure of perceived stress and has been translated to many languages including Persian (Khorsandi et al., 2013), Turkish, and Spanish (Orucu and Demir, 2009; Remor, 2006). While the PSS has 4-, 10-, and 14-item versions, the latter was used in the current research. The answers ranged from "not at all" to "very much" and were scored as 0–4. Moreover, items 4–7, 9, 10, and 13 were scored reversely. The total scores ranged between 0 and 56 and higher scores indicated higher levels of perceived stress. The scale actually explored the thoughts and feelings of the respondents during the past month. Cohen et al. (1983) compared the PSS with the Life Event Scale and concluded that the PSS provided a better prognosis of psychological and physical symptoms and the need for health services. Bastani et al. (2005) used this scale among an Iranian population and confirmed its reliability (Cronbach's alpha = 0.74).

Procedure

First, a list of health centers in Borujerd, Iran was prepared. A table of random numbers was then used to randomly select two centers out of the 20 enlisted centers. The researchers attended the selected health centers with a letter of introduction from Arak Azad University (Arak, Iran). The number of eligible primigravid women whose delivery date was expected to be between October

Table 1. General structure of the designed intervention derived from stress inoculation training (Meichenbaum, 1993).

Session	Tasks
Sessions 1 and 2	Greeting Introduction Evaluation of pregnancy-related stress, psychological changes in pregnancy, effects of stress on pregnancy, advantages of relaxation in pregnancy Introducing the concept of coping, explaining three ways of coping (practical, emotional, and avoidance) Break and homework assignment Feedback of the sessions
Sessions 3 and 4	Greeting Evaluation of homework assignments Training three strategies called "expressing emotions," "use of physical activity," and "relaxation" Break Homework assignment Feedback of the previous sessions
Sessions 5 and 6	Greeting Evaluation of homework assignments Training two strategies called "self-control" and "self-obligation" Break Training two strategies called "time management" and "problem-solving" Homework assignment Feedback of the previous sessions
Sessions 7 and 8	Greeting Evaluation of homework assignments Training two strategies called "positive self-talk" and "cognitive restructuring" Break Summarization of the sessions

and August 2011 was then calculated for each center. Afterward, a list of all pregnant women attending all health centers was created and their files were numbered. In the next stage, a table of random numbers was utilized to select 64 eligible women and the subjects were randomly (using a randomized block design) allocated to the control and case groups by a computer (all subjects in each group were selected from a particular center not from both centers). Since two women were excluded from the case group (one moved to another city and the other developed gestational diabetes), data from the remaining 30 cases were finally analyzed.

After selecting the pregnant women, both groups were asked to complete the PSS carefully (pre-test). The educational content (cognitive-behavioral coping skills based on the SIT) was delivered to the case group by holding eight 90-minute sessions over 8 weeks (Table 1). However, the control group did not receive any intervention.

After the end of the intervention in the case group, the PSS was again completed by both groups.

The educational intervention in this study was designed to educate the subjects about the interactive nature of stress and how to deal with it; methods of self-control; identification of thoughts, images, feelings, and behaviors; and non-adaptive undetected compromise evaluations in order to facilitate compatibility and

Table 2. Mean perceived stress scores of the pregnant women in the case and control groups.

Stress score	Group	Number	Mean	Standard deviation	*p* value
Baseline	Case	30	27.50	4.50	0.826
	Control	32	27.28	3.32	
After the intervention	Case	30	18.97	3.27	0.001
	Control	32	27.77	6.03	

compliance. It instructed the participants about problem-solving skills (i.e. outcome prediction, decision-making, and evaluation), pattern-making, coping skills, and emotion regulation. It also sought to help the subjects gain knowledge, self-awareness, and coping skills to tackle expected/unexpected stressful events through practical methods of mental imagery and behavioral practice. The women's homework was actually graded to foster and strengthen their coping skills (Table 1).

During the second phase of the intervention, women in the case group, who had already acquired a variety of coping skills, were asked to practice their skills in the clinic and then gradually in real-life events. Since in some cases inter- or intra-personal factors hindered the implementation of the acquired skills, the therapist/educator tried to collaborate with the subjects to identify, understand, and overcome such factors. The third stage involved the application of the learned skills and continuous follow-up to prevent the recurrence of the problem and assess the need for gradual exposure to reality (Meichenbaum, 1993). Upon the completion of the intervention in the case group, the PSS was again filled out by both groups (post-test).

Finally, the collected data were analyzed with descriptive (mean and percentage) and inferential (*t*-test) statistics in SPSS for Windows 16.0 (SPSS, Inc., Chicago, IL, USA). The significance level was set at $p < 0.05$ in all analyses.

In order to observe ethical considerations, after collecting the required data, the control group was provided with an intensive four-session course on coping strategies. Although the content of this course was similar to that held for the intervention group, holding eight sessions of education was impossible due to the proximity of delivery.

Results

The mean ages of the cases and the controls were 20.25 ± 1.40 and 20.43 ± 1.86 years, respectively (p= 0.610). The mean gestational age was 26.89 ± 3.880 weeks in the case group and 25.3 ± 3.5 weeks in the control group (p = 0.701). Most of the participants in both groups had high school diploma (45.3%).

Table 2 shows the mean PSS scores in the case and control groups. As seen, while the two groups had no significant difference in terms of baseline PSS scores (p = 0.826), the intervention could significantly decrease the mean score of the case group (p = 0.001).

Discussion

According to our findings, the educational program designed based on SIT could significantly decrease the stress level in pregnant women. Similarly, Saisto et al. (2001, 2006) reported that educating pregnant women with coping skills (e.g. relaxation, breathing, imagination, and cognitive skills) could effectively lower the fear and anxiety associated with delivery. In a study conducted by Huizink et al. (2003) in Canada, moderate and severe levels of stress were experienced by 40.2 percent and 9.7 percent of pregnant women, respectively. Previous studies have shown the desirable and favorable effects of relaxation on stress and anxiety levels in pregnant women (Bastani et al., 2005).

The psychological crises resulting from stress have to be confronted effectively at each stage of pregnancy. Otherwise, they will manifest as physical, emotional, social, or cognitive incompatibility at later stages. Since stress and the consequent anxiety can end up in various diseases under certain conditions (Sadock et al., 2009), relaxation techniques and educational lifestyle interventions (during and even before pregnancy) have gained increasing attention. Such techniques have been found to improve pregnancy outcome through providing mothers-to-be with necessary health-related skills and helping them play their maternal roles efficiently (Lowdermilk and Perry, 2007). Among all existing methods of training, SIT is a widely accepted approach comprising a variety of activities including conceptualization, relaxation, problem-solving, and cognitive-behavioral exercises and techniques (Meichenbaum, 1993). Mehdizadeh et al. (2003) reported decreased demand for cesarean section after attending pregnancy preparation classes. The beneficial effects of educating pregnant women on the promotion of safe childbirth were also suggested by Kazemzadeh et al. (2005).

Appropriate awareness and education about psychological health is essential to maintain maternal and child health during pregnancy. Fears in pregnant women regarding delivery mainly originates from the incorrect and exaggerated beliefs and statements received from their family members, friends, and acquaintances. These opinions, which are generally delivered to pregnant women without considering their special conditions and psychological status, result in poor judgment about delivery, especially in primigravid women. Therefore, increasing the knowledge of mothers can lower their stress (Lowdermilk and Perry, 2007). While numerous studies have evaluated the effects of stress on pregnancy outcome (Hobel et al., 2008), few have assessed the efficacy of cognitive-behavioral interventions during pregnancy. Hence, comparing our findings with the results of other studies was not possible. Apparently, further studies are required to determine the effect(s) of similar interventions on maternal stress and pregnancy outcome.

Conclusion

Considering the high prevalence of stress during pregnancy, healthcare providers and midwives are required to evaluate the stress levels of pregnant women in their prenatal visits. They should also train women about appropriate coping strategies to reduce their stress during pregnancy and minimize the adverse effects of stress on pregnancy outcomes. Such approaches will benefit not only the mothers but also the whole family (Bastani et al., 2005).

Acknowledgements

The authors wish to thank all pregnant women who participated in this study. Our gratitude also goes to the chief (Dr Shahram Mamdouhi) and all the personnel of Borujerd health center. This manuscript was prepared based on an MSc thesis in Islamic Azad University (registration No. 12120706882006).

Funding

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

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