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# Assessing the effect of self-care education on anxiety and depression among pregnant women with a history of spontaneous abortion

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## Abstract:

**INTRODUCTION:** Abortion is one of the most common complications of early pregnancy, which emerges as a physically and mentally devastating experience. Due to the prevalence and importance of postabortion mental health problems and their adverse effects on subsequent pregnancies, some interventions should be made to reduce the resultant anxiety and depression. The present study aimed to determine the effect of self-care education on anxiety and depression among pregnant women with a history of spontaneous abortion.

**METHODS:** This randomized quasi-experimental study was performed on ninety pregnant women with a history of spontaneous abortion who referred to health centers in Zahedan in 2019. The samples were selected by convenience sampling method and randomly assigned to two intervention and control groups. Between 6 and 16 weeks of gestation, the participants in the intervention group received four sessions of 60-min self-care training over 2 weeks. On the other hand, the control group received routine pregnancy care. Data collection tools included a demographic and fertility evaluation questionnaire, a 6-item short-form of the state scale of the Spielberger State-Trait Anxiety Inventory, and a short form of Beck Depression Inventory. Posttest was performed 4 weeks after the end of the intervention. The data were analyzed in SPSS software (version 21) using statistical tests of independent *t*-pair, paired *t*-pair, Chi-square, and Fisher's exact test.

**RESULTS:** Based on the obtained results, there was no significant difference between the two groups in terms of anxiety and depression scores before the intervention. Nonetheless, after the intervention, the mean scores of anxiety and depression in the intervention group were calculated at  $7.31 \pm 1.31$  and  $4.71 \pm 1.90$ , respectively. However, these scores were reported as  $1.87 \pm 13.46$  and  $9.31 \pm 1.59$  in the control group, respectively ( $P = 0.0001$ ).

**CONCLUSION:** As evidenced by the obtained results, self-care education is effective in the reduction of anxiety and depression in pregnant women with a history of spontaneous abortion. Therefore, health professionals and health-care providers should enrich prenatal care programs with these training sessions and provide women with peace of mind and comfort during pregnancy.

## Keywords:

abortion history, anxiety, depression, pregnancy, self-care

## Introduction

Abortion is the spontaneous or induced termination of pregnancy before the fetus has attained viability. Conventionally, abortion is defined as pregnancy termination

by 20 weeks of gestation and birth of a fetus weighing <500 gr.<sup>[1]</sup> It is one of the most common complications of early pregnancy.<sup>[2]</sup> It is estimated that 20% of diagnosed pregnancies<sup>[3,4]</sup> and more than half of all pregnancies end in miscarriage.<sup>[5]</sup> Miscarriage has destructive physical

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and psychological side effects.<sup>[6]</sup> Nearly 48%–51% of women who have experienced miscarriage develop psychological complications.<sup>[7]</sup> The rate of mental disorders in women with a history of pregnancy loss increases by 30%, as compared to women without this experience.<sup>[8]</sup> The results of a review study indicated that women with a history of abortion were more susceptible to psychological trauma, such as anxiety and depression, as compared to other women. Fertel *et al.* demonstrated that women with a history of spontaneous abortion experience higher levels of anxiety in the first trimester of pregnancy, in comparison to women without a history of spontaneous abortion.<sup>[9]</sup> Bergner *et al.* showed that pregnancy loss was associated with increased symptoms of depression in the first trimester of pregnancy.<sup>[8]</sup> In a study by Meredith *et al.* on ten mothers (aged 22–39 years, primiparae or multiparae) who had a history of perinatal loss, the data were collected by semi-structured interviews in the hospital or by telephone. The results showed that the participants expressed their satisfaction of Pregnancy After loss clinic (PALC) and recommended that PALC should be developed and support families with experiences of perinatal loss.<sup>[10]</sup>

Symptoms of postabortion anxiety and depression persist until the next pregnancy. Because many women get pregnant within 18 months of a loss, the effect of the spontaneous abortion on the next pregnancy assumes crucial importance.<sup>[11]</sup> Post-abortion psychological complications persist up to 6 months and disappear after 3 years.<sup>[12]</sup> Some other researchers believe that it takes 5 years to eliminate all unsafe abortion-related complications.<sup>[13]</sup> Women with prior miscarriage may worry about future pregnancies and consider the next pregnancy to be very valuable.<sup>[14]</sup> Women establish their identity by giving birth to a child, and they consider their biological, psychological, and social success in their ability to give birth to a child, and if they lack this power, they feel inadequate.<sup>[15]</sup>

Pregnant women with a history of anxiety or depression are exposed to a wide range of complications, such as preterm birth and low birth weight,<sup>[16]</sup> impaired mother–child relationship, decreased mother’s ability to care for her newborn,<sup>[17]</sup> emotional distress in future,<sup>[18]</sup> disorders in child’s growth and development, child hyperactivity,<sup>[19]</sup> infant insomnia,<sup>[20]</sup> and behavioral problems in early childhood.<sup>[21]</sup> Similarly, in a study by Côté-Arsenault, multigravid women with and without a history of perinatal loss on anxiety in pregnancy were compared. The sample consisted of 160 women with 12–28 weeks’ gestation: 96 multigravidas without a history of loss and 74 women with a history of one or two losses. The findings showed that pregnancy anxiety was higher in women with a history of perinatal loss.<sup>[22]</sup>

Depression during pregnancy is associated with a lack of proper self-care during pregnancy, postpartum depression, insecure attachment with the newborn, and his/her delayed growth.<sup>[23]</sup> There are a wide variety of new interventions available today to control anxiety. Counseling and training provided by nursing staff is one of the interventions recommended to prevent pregnancy and postpartum anxiety.<sup>[24]</sup> Self-care refers to practicing health-related problem-solving and decision-making interventions to improve women’s health.<sup>[25]</sup> Approximately 65%–85% of health care is provided by the individual and his/her family.<sup>[26]</sup>

In addition, in a study by Smorti *et al.* (2020), the levels of fear, depression, and anxiety in women with a history of abortion were investigated. The sample consisted of 208 women with a mean gestational age of 34.68 weeks.

The sample included 159 women without a previous miscarriage (72.3% primiparae and 27.7% multiparae) and 49 women with a history of miscarriage (53.1% primiparae and 46.9% multiparae). The results showed that primiparae reported higher levels of fear, anxiety, and depression of childbirth than multiparae. Furthermore, women without a history of previous perinatal loss showed lower levels of depression and fear of childbirth than women with a previous perinatal loss. In order to solve these problems, it is necessary to have support groups for primiparae.<sup>[27]</sup>

Although health systems are responsible for health-care provision during pregnancy, the pregnant women themselves shoulder the ultimate responsibility for making the right decisions and maintaining their health.<sup>[26,28]</sup> Pregnant women need to be empowered to take care of themselves during the span of pregnancy so that they can ensure the health of themselves and their newborns.<sup>[29]</sup> The engagement in self-care practices increases autonomous behavior and helps women to have purposeful performance.<sup>[30,31]</sup>

Self-care improves people’s health and quality of life, increases patient satisfaction, allows optimal use of services, and reduces health-care costs.<sup>[25]</sup> On the other hand, the decreased levels of self-care during pregnancy increase adverse birth outcomes, such as preterm labor, low birth weight, and low Apgar score.<sup>[24]</sup> Despite the prevalence and severity of postabortion psychological problems and their effect on subsequent pregnancies, previous studies have mainly focused on postabortion depression and anxiety,<sup>[32]</sup> and only a few studies have assessed the interventions on postabortion pregnancies.

With this background in mind and because no interventional research has been performed on the effect of self-care training on anxiety and depression in

postabortion pregnancy in Iran, the present study was conducted to investigate the effect of self-care training on anxiety and depression in pregnant women with a history of spontaneous abortion.

## Methods

This quasi-experimental study was conducted on ninety pregnant women with a history of spontaneous abortion, who were referred to the comprehensive health centers of Zahedan and were randomly assigned to two groups, from October to December 2017. According to the study conducted by Shakouri (2018) on the effect of educational-supportive intervention based on Orem's self-care pattern on the anxiety of primigravida, the sample size was estimated at 45 in each group and 90 in total using the test power of 95% and the confidence interval of 95%.<sup>[33]</sup>

The inclusion criteria entailed: (1) normal and singleton pregnancy; (2) a history of only one spontaneous abortion; (3) pregnancy between 6 and 16 weeks; (4) lack of known mental disorder, addiction, social-psychological crisis, such as the death of loved ones or physical problems and serious illness in the last 6 months; 5-a patient Health Questionnaire 9 (PHQ-9), score of 8-15(moderate) and 6-Anxiety score of 10 than the STAI Questionnaire. On the other hand, the exclusion criteria included (1) the occurrence of pregnancy problems, (2) end of pregnancy, and (3) absence in training programs for more than one session. The participants were selected by convenience sampling method and randomly assigned to intervention and control groups.

The data collection tool consisted of three parts. The first section included a personal and fertility information questionnaire, including maternal age, gravidity, the number of live and stillbirths, gestational age, abortion to current pregnancy, intended or unintended pregnancy, occupational status, educational status, and characteristics of the spouse, such as age, education, and occupational status.

The second part was the Spielberger State-Trait Anxiety Inventory (STAI). This questionnaire consists of six items that are answered on a 4-point Likert scale from 1 (not at all) to 4 (very much so). The minimum score ranges between 6 and 24. The items 1, 4, and 5 are reverse scored items, and items 2, 3, and 6 of STAI are the most popular tools for measuring anxiety. The validity of the 6-item short-form of STAI has been assessed and confirmed by Marteau and Bekker and Chlan *et al.*, which has been shown to have a high internal reliability of 0.89 and be comparable with the 20-item form in terms of validity.<sup>[34]</sup>

In a study conducted by Taavoni *et al.*, correlation coefficient of STAI was calculated at 0.76 using the

interval halving method and its reliability was measured at 0.73 using Cronbach's alpha method.<sup>[35]</sup> In the present study, its reliability was obtained as 0.88 using Cronbach's alpha. The third part was the 13-item Beck Depression Inventory which is the shortened form of the 21-item version that was introduced in 1972.<sup>[36]</sup> Each question is answered on a 4-point Likert scale from 0 to 3, with a maximum score of 39.<sup>[37]</sup>

Dagher and Green<sup>[38]</sup> reported a reliability and internal consistency of 0.83. In a study conducted by Dehghani in Ahvaz, the reliability was obtained as 89% using Cronbach's alpha and it was calculated at 87% using interval halving method.<sup>[39]</sup> In the present study, he reliability was calculated at 0.78 using Cronbach's alpha.

After obtaining the necessary permission for sampling, the researchers referred to the comprehensive health centers of the city. Moreover, the necessary arrangements were made with relevant international bodies to cooperate in conducting the current study. Among pregnant women with a history of miscarriage who referred to these centers for maternity care, eligible individuals were either selected by convenience sampling or were identified and contacted using the integrated health system and electronic medical record.

They were provided the objectives of the study, and if they were willing to participate in the study, they were invited to refer to the district health center. Thereafter, according to ethical considerations, informed consent was obtained from the participants. The selected individuals were randomly assigned to intervention and control groups. To this end, some papers were placed in a box with the word "intervention on half of which" and the rest were "control." Each person picked up a piece of paper from the box, and the individuals were randomly assigned to intervention and control groups.

Both groups took pretest by completing a personal and fertility information questionnaire, a 6-item Spielberger questionnaire, and a short form of Beck Depression Questionnaire. In addition, the participants' phone numbers and addresses were obtained to track the intervention and control groups. Thereafter, face-to-face training sessions were provided for the intervention group during four 60-min sessions over 2 weeks at the comprehensive health centers, and a training booklet was delivered to them.

The first session was about the common issues and problems of pregnancy. The content of the second session which focused on nutrition during pregnancy was delivered to the research units. In the third session, the educational content included week-to-week pregnancy changes. The educational content of the fourth

session was about teaching relaxation methods and pain relief. On the other hand, the control group only received the usual pregnancy training in the form of prenatal care.

Finally, in both groups, 4 weeks after the end of the intervention, the study questionnaires were completed again by women's referral to the centers or the researcher's referral to pregnant women's residence. Finally, the participants in the control group were given a training booklet. The obtained data were analyzed in SPSS software (version 21), international Business Machines corporation (IBM), Armonk, New York, USA. The frequency, percentage, mean, and standard deviation were determined using descriptive statistics.

The main research hypotheses were analyzed using paired *t*-test, independent *t*-test, Chi-square test, and Fisher's exact test. *P* = 0.05 was considered statistically

significant. The present study was approved by the ethics committee of Zahedan University of Medical Sciences (IR.ZAUMS.REC.1398.239).

## Results

Table 1 shows the demographic characteristics of pregnant women with a history of miscarriage. The mean ages of women in the intervention group and the control group were reported as  $29.02 \pm 5.78$  and  $27.82 \pm 6.20$  years, respectively, which were not statistically significantly different (*P* = 0.34). The mean gestational ages of women in the intervention group and the control group were  $13.48 \pm 2.93$  and  $13.31 \pm 2.98$  weeks, which did not differ statistically significantly (*P* = 0.077). The mean gravidity scores of pregnant women in the intervention and control groups were reported as  $4.06 \pm 1.54$  and  $3.73 \pm 1.64$ , respectively.

**Table 1: Frequency distribution of demographic information divided by the research group in pregnant women with a history of spontaneous abortion referred to the comprehensive health centers of Zahedan in 2019**

Variable	Intervention group, n (%)	Control group, n (%)	Test results ( <i>P</i> )
The time interval between abortion and the current pregnancy (months)			
<7	6 (13.3)	7 (15.6)	0.69
7- 12	11 (24.4)	8 (17.8)	
13- 24	8 (17.8)	12 (26.7)	
>24	20 (44.4)	18 (40.0)	
Intended or unintended pregnancy			
Intended	27 (82.2)	29 (86.7)	0.56
Unintended	8 (17.8)	6 (13.3)	
Education level			
Illiterate	6 (13.3)	4 (8.9)	0.95
Primary education	13 (28.9)	14 (31.1)	
Senior high school	5 (11.1)	6 (13.3)	
High school and diploma	15 (33.3)	14 (31.1)	
Academic education	6 (13.3)	7 (15.6)	
Occupational status			
Homemaker	44 (97.8)	41 (91.1)	0.26
Employed	1 (2.2)	4 (8.9)	
Spouse's level of education			
Illiterate	3 (6.7)	5 (11.1)	0.7
Primary	9 (20.0)	8 (17.8)	
Senior high school	6 (13.3)	9 (20.2)	
High school and diploma	17 (37.8)	17 (37.8)	
Academic	10 (22.2)	6 (13.3)	
Spouse's occupation			
Unemployed	5 (11.1)	8 (17.8)	0.11
Worker	6 (13.3)	2 (4.4)	
Employee	18 (40.0)	11 (24.4)	
Freelancer	16 (35.6)	24 (53.3)	
Women's age, mean±SD	29.02±5.78	27.82±6.2	0.34
Gestational age, mean±SD	13.48±2.93	13.31±2.98	0.77
Number of pregnancies, mean±SD	4.06±1.54	3.73±1.64	0.29
Number of live births, mean±SD	2.02±1.57	1.75±1.47	0.41
Number of stillbirths, mean±SD	0.04±0.2	0.06±0.25	0.65
Spouses' age, mean±SD	34.11±5.28	31.95±7.04	0.1

SD=Standard deviation

The mean live births and stillbirths in the intervention group were  $2.02 \pm 1.57$  and  $0.04 \pm 0.20$ , respectively. These scores in the control group were obtained as  $1.75 \pm 1.47$  and  $0.06 \pm 0.25$ , respectively, which did not differ statistically significantly ( $P = 0.41$  and  $P = 0.65$ ). In terms of the time interval between the abortion and the current pregnancy, more than 24 months had passed since their abortion in 4.4% of women in the intervention group and 40.0% of cases in the control group. Accordingly, the two groups did not differ statistically significantly in this respect ( $P = 0.69$ ). It is worth noting that pregnancies were intended in 82.2% of women in the intervention group and 86.7% of cases in the control group. The statistical test did not show a significant difference between the two groups ( $P = 0.056$ ).

The majority of the women in the study had a low level of education, and only 13.3% of the cases in the intervention group and 15.6% of the women in the control group had academic education. The two groups did not have a statistically significant difference in terms of education ( $P = 0.95$ ). Nearly 97.8% of cases in the intervention group and 91.1% in the control group were homemakers, and this difference was not statistically significant ( $P = 0.36$ ).

The mean ages of pregnant women’s spouses in the intervention and control group were  $34.11 \pm 5.28$  and  $31.95 \pm 7.04$  years, respectively. Therefore, the two groups were not statistically significantly different ( $P = 0.10$ ). The majority of spouses had a low level of education, and only 22.2% of spouses in the intervention group and 13.3% in the control group had academic education. The educational status of pregnant women’s spouses did not differ statistically significantly between the two groups ( $P = 0.70$ ).

Almost 35.6% of the pregnant women’s spouses in the intervention group and 53.3% in the control group were freelancers. There was no statistically significant difference between pregnant women’s spouses in terms of occupational status ( $P = 0.11$ ). The result of independent *t*-test demonstrated that the mean score of anxiety and depression after self-care training was statistically significantly different between the intervention and control groups ( $P = 0.000$ ). The mean changes in anxiety scores of pregnant women in the intervention group before and after the intervention ( $-1.88 \pm 1.85$ ) were statistically significantly different from those of participants in the control group ( $-1.88 \pm 1.35$ ) [ $P = 0.0001$ ; Table 2].

The mean change in the depression scores of pregnant women in the intervention group ( $-6.55 \pm 1.85$ ) was statistically significantly different from that of the control group ( $-1.57 \pm 1.13$ ) [ $P = 0.0001$ ; Table 3]. Therefore, it can be concluded that self-care training in the intervention group has been able to reduce the mean score of anxiety and depression in pregnant women with a history of abortion.

### Discussion

As evidenced by the results of the present study, the mean scores of anxiety and depression of pregnant women with a history of spontaneous abortion in the group receiving self-care training were significantly lower, as compared to those of the control group. This is indicative of the positive and significant effect of self-care training programs on the anxiety and depression among pregnant women with a history of spontaneous abortion.

There exist no similar studies of self-care training in postspontaneous abortion pregnancies. Nonetheless, the

**Table 2: Comparison of the mean and standard deviation of anxiety score by groups before and after self-care training in pregnant women with a history of spontaneous abortion referring to comprehensive health centers in Zahedan in 2019**

Group	Time, mean±SD			Paired <i>t</i> -test ( <i>P</i> )
	Before the intervention	After the intervention	Alterations	
Intervention	16.2±2.5	7.31±1.39	-8.88±-1.95	0.0001
Control	15.35±2.15	13.46±1.87	-1.88±1.35	0.0001
Independent <i>t</i> -test ( <i>P</i> )	0.09	0.0001	0.0001	

SD=Standard deviation

**Table 3: Comparison of the mean and standard deviation of depression score by groups before and after self-care training in pregnant women with a history of spontaneous abortion referring to comprehensive health centers in Zahedan in 2019**

Group	Time, mean±SD			Paired <i>t</i> -test ( <i>P</i> )
	Before the intervention	After the intervention	Alterations	
Intervention	11.26±2.35	4.71±1.9	-6.55±1.85	0.0001
Control	10.88±2.05	9.31±1.59	-1.57±1.13	0.0001
Independent <i>t</i> -test ( <i>P</i> )	0.42	0.0001	0.0001	

SD=Standard deviation

effects of self-care training on anxiety and depression in patients with different diseases, such as myocardial infarction,<sup>[40]</sup> hemodialysis,<sup>[41]</sup> and thalassemia<sup>[42]</sup> and breast cancer,<sup>[43]</sup> have been confirmed.

In line with the results of the present study, the results of a study carried out by Shakouri *et al.* on first sixty primigravidas showed that educational supportive intervention based on Orem's self-care pattern was effective in reducing the anxiety of pregnant women. They added that the apparent anxiety of mothers in the test group decreased significantly after the intervention.<sup>[33]</sup>

Along the same lines, a study was performed by Khadivzadeh *et al.* on the effect of self-care training programs on perceived stress in insulin-treated women with gestational diabetes mellitus. The results of the mentioned study showed that self-care training programs had a significant impact on the reduction of the mean scores of perceived stress in women in the intervention group.<sup>[44]</sup>

Meredith *et al.* assessed the experience of women from the establishment and operation of pregnancy clinics after pregnancy loss in a qualitative study. The results indicated that the provision of specialized care to this group of pregnant women was effective in the reduction of pregnancy anxiety.<sup>[10]</sup> DeBackere *et al.* believe that training on women's personal choices about prenatal care can help them deal with potential side effects. Moreover, familiarizing mothers with professional maternal health care can help the psychological adjustment to the current pregnancy and the previous pregnancy loss.<sup>[45]</sup>

In the same direction, a study conducted by Zhianian *et al.* (2015) showed that self-care educational intervention based on self-efficacy theory significantly increases awareness, attitude, behavior, and self-efficacy in the intervention group, as compared to those assessed before conducting training program.<sup>[46]</sup> Lack of awareness in women during pregnancy provokes anxiety in pregnant mothers, inducing distress in the brain and increasing the secretion of stress hormones. All these can lead to premature birth and increased medical interventions and complications for the mother and fetus.<sup>[33]</sup> The results of a study carried out by Delaram and Soltanpour showed that providing information to pregnant mothers about their unawareness and effective strategies to support and take care of themselves can be effective in reducing their anxiety during childbirth.<sup>[47]</sup> A study performed by Sajjadi *et al.* with the aim of investigating the relationship between self-care and depression in patients treated with maintenance hemodialysis detected a strong and negative relationship between self-care and depression.<sup>[41]</sup>

The results of a study conducted by Park *et al.* which aimed at linking depression with self-care practices in Type II diabetic patients showed that there was a significant and negative relationship between depression and self-care practices.<sup>[48]</sup> Along the same lines, a study conducted by Rezaian *et al.* (2017) with the aim of linking stress, anxiety, and depression with self-care practices during pregnancy found a significant and inverse linear relationship between them.

This implies that people with self-care experience less stress and depression; however, there was no significant linear relationship between self-care and anxiety, which was inconsistent with the results of the present study.<sup>[49]</sup> The absence of similar studies could be one of the limitations of the present study, which restricted the comparison and discussion of the obtained result. Nevertheless, some attempts were made to address this limitation using other related studies conducted in other areas.

## Conclusion

As illustrated by the obtained results, it can be concluded that self-care training significantly reduced the mean score of anxiety and depression in pregnant women with a history of abortion in the intervention group, as compared to the control group. The mean score of anxiety and depression of participants in the intervention group decreased after the intervention.

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## Conflicts of interest

There are no conflicts of interest.

## References

1. Cunningham FG, Leveno KJ, Bloom SL, Dashe JS, Hoffman BL, Casey BM, *et al.* Williams Obstetrics. 25<sup>th</sup> ed.: McGraw-Hill Education; 2018.
2. Poulouse T, Richardson R, Ewings P, Fox R. Probability of early pregnancy loss in women with vaginal bleeding and a singleton live fetus at ultrasound scan. *J Obstet Gynaecol* 2006;26:782-4.
3. Zinaman MJ, Clegg ED, Brown CC, O'Connor J, Selevan SG.

- Reprint of estimates of human fertility and pregnancy loss. *Psychosom Res* 2019;112 4 Suppl 1:e229-35.
4. Wilcox AJ, Weinberg CR, O'Connor JF, Baird DD, Schlatterer JP, Canfield RE, et al. Incidence of early loss of pregnancy. *N Engl J Med* 1988;319:189-94.
  5. Hure AJ, Powers JR, Mishra GD, Herbert DL, Byles JE, Loxton D. Miscarriage, preterm delivery, and stillbirth: Large variations in rates within a cohort of Australian women. *PLoS One* 2012;7:e37109.
  6. Nikčević AV, Kuczmierczyk AR, Nicolaides KH. The influence of medical and psychological interventions on women's distress after miscarriage. *J Psychosom Res* 2007;63:283-90.
  7. Azizi M, Lamyian M, Faghihzadeh S, Nemat EM. The effect of counseling on anxiety after traumatic childbirth in nulliparous women; A single blind randomized clinical trial. *Behood J* 2010;14:219-27.
  8. Bergner A, Beyer R, Klapp BF, Rauchfuss M. Pregnancy after early pregnancy loss: A prospective study of anxiety, depressive symptomatology and coping. *J Psychosom Obstet Gynaecol* 2008;29:105-13.
  9. Fertl KI, Bergner A, Beyer R, Klapp BF, Rauchfuss MJEJoO, Gynecology, et al. Levels and effects of different forms of anxiety during pregnancy after a prior miscarriage. 2009;142:23-9.
  10. Meredith P, Wilson T, Branjerdporn G, Strong J, Desha L. "Not just a normal mum": A qualitative investigation of a support service for women who are pregnant subsequent to perinatal loss. *BMC Pregnancy Childbirth* 2017;17:6.
  11. Haghparast E, Faramarzi M, Hassanzadeh R. Psychiatric symptoms and pregnancy distress in subsequent pregnancy after spontaneous abortion history. *Pak J Med Sci* 2016;32:1097-101.
  12. Biggs MA, Neuhaus JM, Foster DG. Mental health diagnoses 3 years after receiving or being denied an abortion in the United States. *Am J Public Health* 2015;105:2557-63.
  13. Munk-Olsen T, Laursen TM, Pedersen CB, Lidegaard Ø, Mortensen PB. Induced first-trimester abortion and risk of mental disorder. *N Engl J Med* 2011;364:332-9.
  14. Schoenbaum SC, Monson RR, Stubblefield PG, Darney PD, Ryan KJ. Outcome of the delivery following an induced or spontaneous abortion. *Am J Obstet Gynecol* 1980;136:19-24.
  15. Bahrami N, Sattarzadeh N, Qvjazadh M, Soleimani M, Nelmy H, Sadeghi T. Investigated the relationship between infertility and sexual satisfaction in couples. *J Qazvin Univer Med Sci* 2010;2:32-7.
  16. Ding XX, Wu YL, Xu SJ, Zhu RP, Jia XM, Zhang SF, et al. Maternal anxiety during pregnancy and adverse birth outcomes: A systematic review and meta-analysis of prospective cohort studies. *J Affect Disord* 2014;159:103-10.
  17. Andersson L, Sundström-Poromaa I, Wulff M, Åström M, Bixo M. Depression and anxiety during pregnancy and six months postpartum: A follow-up study. *Acta Obstet Gynecol Scandinavica* 2006;85:937-44.
  18. Gamble J, Creedy D, Moyle W, Webster J, McAllister M, Dickson P. Effectiveness of a counseling intervention after a traumatic childbirth: A randomized controlled trial. *Birth* 2005;32:11-9.
  19. Graignic-Philippe R, Dayan J, Chokron S, Jacquet AY, Tordjman S. Effects of prenatal stress on fetal and child development: A critical literature review. *Neurosci Biobehav Rev* 2014;43:137-62.
  20. O'Connor TG, Caprariello P, Blackmore ER, Gregory AM, Glover V, Fleming P, et al. Prenatal mood disturbance predicts sleep problems in infancy and toddlerhood. *Early Hum Dev* 2007;83:451-8.
  21. O'Connor TG, Ben-Shlomo Y, Heron J, Golding J, Adams D, Glover V. Prenatal anxiety predicts individual differences in cortisol in pre-adolescent children. *Biol Psychiatry* 2005;58:211-7.
  22. Côté-Arsenault D. The influence of perinatal loss on anxiety in multigravidas. *J Obstet Gynecol Neonatal Nurs* 2003;32:623-9.
  23. Toosi M, Akbarzadeh M, Zare N, Sharif F. Effect of attachment training on anxiety and attachment behaviors of first-time mothers. *HAYAT J* 2011;17:69-79.
  24. Avelyn G. The Relationship between Prenatal Self-Care Practices during Pregnancy and Birth Outcomes among Young Mothers Aged 16 to 24 Years Delivering at Gweru Maternity Hospital; 2014.
  25. Rafii-Far S, Attar-Zadeh M, Ahmadzade M. Comprehensive System of Empowering people to take care of your health. *Ghom Univ Med Sci*, 2005; 30-7.
  26. Hotelling BA. The coalition for improving maternity services: Evidence basis for the ten steps of mother-friendly care. *J Perinat Educ* 2007;16:38-43.
  27. Smorti M, Ponti L, Simoncini T, Mannella P, Bottone P, Pancetti F, et al. Pregnancy after miscarriage in primiparae and multiparae: Implications for women's psychological well-being. *J Reprod Infant Psychol* 2020,17:1-1.
  28. Midmer DK. Does family-centered maternity care empower women? The development of the woman-centered childbirth model. *Fam Med* 1992;24:216-21.
  29. Kloeblen AS, Batish SS. Understanding the intention to permanently follow a high folate diet among a sample of low-income pregnant women according to the Health Belief Model. *Health Educ Res* 1999;14:327-38.
  30. Allgood MR. *Nursing Theory-E-Book: Utilization & Application*. Elsevier Health Sciences; 2013.
  31. Aggleton P, Chalmers H. Models of nursing, nursing practice and nurse education. *J Adv Nurs* 1987;12:573-81.
  32. Moradi MM, Jahdi F, Fatemi NS, Montazeri A. The effect of counseling on anxiety levels of women with spontaneous abortion. *Payesh (Health Monitor)* 2016;15:174-9.
  33. Shakouri N, Noroozi HM, Tafazoli M, Mazlom SR. Effect of the "Orem Self Care model"-based educational-supportive intervention on the anxiety of primigravidae. *Horizon Med Sci* 2018;24:41-6.
  34. Marteau TM, Bekker H. The development of a six-item short-form of the state scale of the Spielberger State-Trait Anxiety Inventory (STAI). *Br J Clin Psychol* 1992;31:301-6.
  35. Taavoni S, Najmi A, Haghani H. Investigating the effect of viewing scenes of nature and nature scenes along with nature sounds on the anxiety during the first stage of labor in primiparous women. *Complementary. Med J Arak Univer Sci* 2018;8:2354-63.
  36. Beck AT, Steer RA, Carbin MG. Psychometric properties of the Beck Depression Inventory: Twenty-five years of evaluation. *Clin Psychol Rev* 1988;8:77-100.
  37. Kim KE, Choi JH, Kim YH. Effect of infant health problem, mother's depression and marital relationship on infant abuse in Korea: Mediating pathway of marital relationship. *Asian Nurs Res (Korean Soc Nurs Sci)* 2014;8:110-7.
  38. Dagher RK, Green KM. Does depression and substance abuse co-morbidity affect socioeconomic status? Evidence from a prospective study of urban African Americans. *Psychiatry Res* 2015;225:115-21.
  39. Dehghani Y, Rajabi S. Effectiveness of cognitive-behavior therapy on depression and craving beliefs of abusers under methadone maintenance treatment. *Jentashapir J Health Res* 2016;7(4).
  40. Aghakhani N, Sanae K, Baghaei R, Khademvatan K. The impact of educational-supportive self-care package on anxiety, depression and stress in myocardial infarction patients. *J Urmia Nurs Midwifery* 2017;15:281-91.
  41. Sajjadi M, Akbari A, Kianmehr M, Atarodi A. The relationship between self-care and depression in patients undergoing hemodialysis. *J Q Horizon Med Sci* 2008;14:13-7.
  42. Madmoli Y, Akhaghi Dezfuli SM, Adavi A, Maraghi E, Heidari-Soureshjani R, Madmoli M. The effect of Orem self-care on mental health of patients with thalassemia major. *J Clin Nurs Midwifery* 2018;7:108-15.
  43. Bakhtiari M, Eslami M, Fesharaki M. Effect of self care education on

- mental health of breast cancer women undergoing chemotherapy in cancer Institute of Tehran. *J Iran Q J Breast Dis* 2011;4:42-7.
44. Khadivzadeh T, Azhari S, Esmaily H, Akhlaghi F, Sardar MA. Effects of self-care education on perceived stress in women with gestational diabetes under insulin treatment. *Evidence Based Care* 2015;5:7-18.
45. DeBackere KJ, Hill PD, Kavanaugh KL. The parental experience of pregnancy after perinatal loss. *J Obstet Gynecol Neonatal Nurs* 2008;37:525-37.
46. Zhianian A, Zareban I, Ansari-Moghaddam A, Rahimi SF. Improving self-care behaviours in pregnant women in Zahedan: Applying self-efficacy theory. *Caspian J Health Res* 2015;1:18-26.
47. Delaram M, Soltanpour F. The effect of counseling in third trimester on anxiety of nulliparous women at the time of admission for labor. *Zahedan J Res Med Sci* 2012;14(2).
48. Park H, Hong Y, Lee H, Ha E, Sung Y. Individuals with type 2 diabetes and depressive symptoms exhibited lower adherence with self-care. *J Clin Epidemiol* 2004;57:978-84.
49. Rezaeian SM, Abedian Z, Latifnejad Roudsari R, Mazloom SR, Dadgar S. The relationship of prenatal self-care behaviors with stress, anxiety and depression in women at risk of preterm delivery. *Iran J Obstetr Gynecol Infertil* 2017;20:68-76.