Journal of Caring Sciences, 2018, 7 (2), 101-106
doi:10.15171/jcs.2018.016
http:// journals.tbzmed.ac.ir/ JCS

Original Article

The "Cooperative-Supportive'' Intervention for Improving Mental Health Status among Pregnant Women

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ARTICLE INFO

Article History:
Received: 7 June 2017
Accepted: 10 Dec. 2017
ePublished: 1 June 2018

Keywords:
Pregnant women, Mental health, Intervention

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ABSTRACT

Introduction: Maternal mental health during pregnancy has a major impact on fetal growth and consequently, child health. The objective of this study was to assess the effect of "Cooperative-Supportive" Intervention Program on Pregnancy.

Methods: The present before and after interventional research was conducted on 114 pregnant women referring to Khoy health centers in 2014. Pregnant women were randomly divided into intervention (n=57) and control groups (n=57). The data collection tool in this research was the researcher-made questionnaire based on the Predisposing, Reinforcing and Enabling Constructs in Educational Diagnosis and Evaluation (PRECEDE) model which assessed the participants' predisposing, enabling, and reinforcing factors. The educational interventions for enhancing pregnant women's stress controlling skills were conducted and also practical pacifying lessons were held for the intervention group during five weeks with relaxation exercises. In order to assess health status among pregnant women, knowledge, attitude, depression, anxiety and self-efficacy were investigated by applying different scales and questioners. The questionnaires were completed before and after the interventional program. The data were analyzed, using suitable statistical tests.

Results: After the intervention, the mean score of PRECEDE major components significantly increased and the total anxiety and depression scores decreased in the intervention group in comparison to those of the control group.

Conclusion: The present study showed the positive impact of educational intervention programs based on PRECEED model and major components on reducing anxiety and depression, and finally mental health promotion in the studied population.

Citation: Hajmohamadi N, Ghalichi F, Bakhtari Aghdam F, Matlabi H. The "cooperative-supportive'' intervention for improving mental health status among pregnant women. J Car Sci 2018; 7 (2): 101-6. doi:10.15171/jcs.2018.016.

Introduction

Health promotion and providing a sense of well-being for women in all periods of their lives leads to better quality of life.[1-3] Adolescence, pregnancy and menopause are the critical stages of women's lives. Pregnancy is a phenomenon that causes major physical, physiological and psychological changes in women. Although, this is a pleasant period for a majority of women, it is often considered as a stressful and anxious period.[4,5] Relatively few studies have been conducted on the psychological changes during pregnancy compared to the physical aspects of these changes. According to Cates, 15-20% of pregnant women suffer from mental health problems that have to be treated.[5] According to these studies, since mental health also affects physical health, the mental changes during pregnancy need to be studied thoroughly.[6] Depression, isolation, anxiety, phobic anxiety, emotional instability and irritability are just some of the mental disorders observed in pregnancy.[7]

For several reasons in comparison to other periods of life, maternal mental health is at risk and the major reasons can be attributed to mother's concern regarding infant abnormalities, labor pain, accepting responsibility and motherhood which are the major prenatal anxiety sources.[8,9] The high level of anxiety and stress are associated with an increased risk of preterm delivery, low birth weight, and spontaneous abortion.[10] The relationship between prenatal anxiety and sleep disorders has been previously emphasized by some studies. In fact, maternal anxiety is known to cause sleep issues in infants.[11-13]

The prevalence of mental health disorders among pregnant women in Iran has been previously reported, 31.6% in Kuhdasht, and 44.8% in Isfahan.[14,15]

Pregnant women's lack of education and their inadequate preparation for pregnancy are the main reasons for medical interventions which complicate mother and fetus conditions.[16] Studies have indicated that the provision of preparatory trainings on anxiety during pregnancy and delivery can reduce anxiety; however, once the education is discontinued, its impact gradually decreases, and the anxiety begins to rise again.[17,18] One possible solution to reduce anxiety and fear during pregnancy, and improve maternal mental health is relaxation which, as an effective non-pharmacological intervention, increases mental health among anxious pregnant women at least during pregnancy, and increases their confidence. Relaxation skills reduce perinatal, preterm labor, and the pain stress, as well as lowering the need for drug therapy.[19] In order to deal with mental disorders during pregnancy, supportive, educational, and cooperative

programs, and interventions for adjusting and dealing with these problems must be considered.[14] On the other hand, the prevention strategy, and finally, behavioral changes require the use of an educational model. One of the planned educational models is the Predisposing, Reinforcing and Enabling Constructs in Educational Diagnosis and Evaluation (PRECEDE) model. The PRECEDE model assesses predisposing, enabling and reinforcing factors.[20]

According to this model, a person's behavior results from predisposing factors preceding behavioral changes which motivate behavior, knowledge, attitude, beliefs, values, and perceptions. Enabling factors that change behavior or the environment and allow the realization of a motivation or environmental policy are resource acquisition, availability, rules, regulations, and skills. The reinforcing factors that follow behavior and provide continuous bonuses to keep this behavior are family, peers, teachers, health workers, etc.[21,22] Findings of the satisfaction study showed that training through the PRECEDE - PROCEED model by combining HBM model and self- efficacy theory during pregnancy is an appropriate method for establishing self-esteem on the ability to have natural birth, decrease delivery fear, and consequently, increase the rate of natural birth.[23]

Since the present study is based on empowerment and implementation of cooperative behaviors, it seems that implementing the PRECEDE model may be efficient. Considering the fact that pregnant women are considered as one of the sensitive groups that guarantee mental, family and society health, and considering the fact that these women train children and the next generation, improving mental health is very important. Thus, this study aimed to use the PRECEDE model to promote pregnant women's mental health.

Materials and methods

The present before and after interventional study was conducted based on pre-test and post-test methods. The study population were pregnant women referring to health centers in Khoy. Inclusion criteria were women in their second trimester of pregnancy (13-27 weeks), and not having diseases or disorders that endangered pregnancy.

Sampling: by simple random sampling method, two of 4 urban sections in Khoy which had similar social and economic statuses were randomly selected and divided into two intervention and control groups. Before implementing the study, appropriate information was given to subjects and written informed consent was obtained from the participants. Based on the results of an Iranian project and with considering 95% confidence interval and 80% testing power, 57 pregnant women were selected from the first urban health care center for the intervention group, and 57 pregnant women were selected from the second urban health care center as the control group.[14] During the research, 2 subjects were excluded from the control group, 1 person because of migration from residence and 1 person because of stillbirth. Also, 2 subjects were excluded from the intervention group due to lack of participation in educational programs and abortion, thus the final analysis was conducted upon 55 women in each group.

The data collection tool in this research was the researcher-made questionnaire based on the PRECEDE Model's structures and the standard questionnaire. The first section was related to predisposing factors (knowledge, attitude). The knowledge and attitude questions were designed in 6-7 questions. The second part of the questionnaire was related to enabling factors (2 questions) and the third part of the questionnaire was related to reinforcing factors (3 questions). The questionnaire was designed by studying authentic sources and books, and for determining the scientific validity of the questionnaire, the content validity index and content validity ratio methods were calculated (CVI= 96% and CVR= 86%).[23-25] Then, the questionnaire was assessed by 10 experts in the health education center and their opinions were applied on the validity of questionnaire. The questionnaire's alpha Cronbach was measured by the Internal Consistency method and reported as 0.78.

The questions of the knowledge section were designed using a three-point scale, score 1 implied a correct answer, and score 0 indicated an incorrect answer. The questions in the attitude section were designed, using the three-point Likert scale (Agree = 3, No Idea = 2, Disagree = 1). The questions of the enabling factors section were classified as Yes/No, and their frequency and percentage were calculated, and the reinforcing section was assessed using the three-point scale (Yes = 3, Somehow =2, No = 1). The second part included the social support appraisals scale. This questionnaire was designed by Vaux and colleagues in 1986. The validity and reliability of the questionnaire has been checked in Iran.[26] The questionnaire contains 23 questions measuring three dimensions. The family and friends support subscale consists of 8 questions, and the support from others subscale contains 7 questions. In this approach, the support from family subscale was used. Also, 8 questions were considered using Yes/No (Yes=1, No=0) answers.

In addition, the third section contains questions regarding pregnant women's self-efficacy. The self-efficacy scale contains 13 questions according to the three-point Likert scale (Agree= 3, No idea=2, Disagree= 1).[27] Furthermore, for measuring anxiety level, the State-Trait Anxiety Inventory was used.[28] The questionnaire contains 40 questions, 20 questions of which were related to the state anxiety, and the other 20 to trait anxiety, which are designed as positive and negative, using the four-point scale (Never = 0, Somehow = 1, Average = 2, Too much = 3). According to Mahram the reliability of the total score, trait anxiety, and state anxiety are 0.91, 0.90, and 0.70, respectively.[28]

To assess depression, the Edinburgh Inventory was used. The Edinburgh questionnaire is designed as 10 four-point questions. In general, the score of each question varies between 0-3 (Often = 0, Sometimes = 1, Not so much = 2, Almost Never = 3). The questionnaire has been widely used for research as a diagnostic criterion for depression, and its sensitivity and specificity have been

approved previously.[29] For the negative questions, the reverse scoring was used.

Before the intervention, the questionnaires were completed by both groups, and for increasing access to enabling factors, the pregnant women in the interventional group were trained by educational programs. The educational intervention program was conducted for 5 sessions (60-90 min), with each session held once a week. In the First week: A session was held for introducing pregnant women's mental health problems, and the necessity of improving mother and fetus health during pregnancy. In the second week, the physical and physiological changes during pregnancy were introduced and the effects of these changes on maternal mental status were considered. In the third week, fetus growth in different months of pregnancy and the impact of these changes on maternal mental health status were assessed. In the fourth week, solutions for further compliance with changes during pregnancy, and improving the compliance process with these changes such as proper nutrition, personal health, increased confidence and religious beliefs, and introduction of non-pharmacological methods were defined in order to reduce anxiety including relaxation exercises by the researcher, which were repeated frequently. In the fifth week, the relaxation exercises were repeated by pregnant women, and they were encouraged to exercise better at home. In order to increase the reinforcing factors, and for pregnant women's emotional support, a group was formed in the form of a communication-health campaign.

This group contained 5 doctors, midwives, and other relevant staff working in health-centers, pregnant women and their families, health volunteers, council members and religious clerics. The group of doctors, midwives, and family health workers formed the counseling sessions of pregnant women's awareness, and the instructors including the health volunteers, council members, governorship, and religious clerics began the trainings after acquiring essential instructions. In order to increase pregnant women's social support, a group discussion session was formed with questions and answers for their families. The content of these sessions was about informing the families of the importance of their role in increasing pregnant women's mental health and supporting them during pregnancy. At the end of the intervention, the questionnaires were completed again by both groups. Data were analyzed using descriptive statistics, independent t-test, paired t-test, and ANOVA with repeated measures by the SPSS.

Results

The results of the study indicated no statistically significant differences between the experimental and control groups, in terms of demographic characteristics except for variables such as the fetuses' gestational age per week (Table 1).

The findings indicated no statistically significant difference between the mean score of mental health in both groups before the educational intervention program (P=0.154), but after that, a significant increase was seen in the mean mental health score (P< 0.001), representing improvement of mental health in the experimental group. The mean score of depression and anxiety decreased significantly after the intervention in comparison to that before the intervention and that of control group (P< 0.001) (Table 2). Regarding the model structures, according to Table 3, after performing the educational program, the mean score of predisposing factors (knowledge, attitude and self-efficacy), as well as reinforcing factors (reinforcing factors and social support), in the intervention group significantly increased in comparison to that before the educational program or that of control group (P≤0.001).

Also, regarding the access to enabling factors (use of information resources), a significant increase was observed in having access to and using educational resources in the intervention group compared to the control group after the educational intervention. The maximum increase belonged to access to information resources through health workers (98.2%) and family and friends (72.7%).

Table 1. The distribution of socio-demographic characteristics of the participants (n =114)

Variables	Intervention group N (%)	Control N (%)	P
Employment status			1
Unemployed	57(100)	56(98.2)	
Husband's job			0.63
Employed	4(7)	4(7)	
Self- employed	53(93)	51(89.5)	
Unemployed	0	2(3.5)	
Educational level			0.74
Illiterate	5(8.8)	8(14)	
primary	16(28.1)	19(33.3)	
Secondary	27(47.4)	20(35.1)	
High school	8(14)	9(15.8)	
diploma	1(1.8)	1(1.8)	
Academic degree	1(1.8)	1(1.8)	
Husband's education			0.001
Illiterate	12(21.1)	15(26.3)	
primary	10(17.5)	29(50.9)	
Secondary	24(42.1)	7(12.3)	
High school	9(15.8)	3(5.3)	
diploma	9(15.8)	3(5.3)	
Academic degree	9(15.8)	3(5.3)	
Home ownership rate	4(7)	6(10.5)	0.18
Unintended Pregnancy	13(22.8)	13(22.8)	0.33
Gestational age (week)			0.005
13-17	27(47.4)	27(47.4)	
18-22	20(35.1)	20(35.1)	
23-27	10(17.5)	10(17.5)	
History of abortion or stillbirth			0.64
No	47(82.5)	47(82.5)	
History of physical illness			0.20
No	56(98.2)	56(98.2)	
History of birth defects			1
No	57(100)	57(100)	

Discussion

The findings showed that after the educational intervention, the intervention group obtained higher scores compared to the control group in aspects of

Table 2. Comparing the mean and standard deviation of main variables among both groups (n=114)

Variables	Before Intervention Mean (SD)	After Intervention Mean (SD)	P
Mental Health score			
Intervention	46.45(9.56)	25.72(5.43)	<0.001
Control	42.75(7.16)	40.65(5.55)	0.86
Depression			
Intervention	49.09(15.1)	26(10.45)	<0.001
Control	49.63(14.16)	44.78(13.17)	0.16
Trait anxiety			
Intervention	50.33(10.47)	31.87(5.85)	<0.001
Control	49.27(9.49)	48.81(9.45)	0.56
State anxiety			
Intervention	57.78 (10.07)	36.09(7.43)	0.007
Control	49.45(11.52)	47.09(7.23)	0.24
Total anxiety score			
Intervention	54.06(9.45)	32.98(5.56)	<0.001
Control	49.36(11.52)	47.95(5.43)	0.23

Table 3. Comparing the pre-test and post-test scores of variables in both groups (n=114)

Variables	Before Intervention Mean (SD)	After Intervention Mean (SD)	P
Knowledge			
Intervention	75.75 (19.98)	93.03 (10.96)	<0.001
Control	69.39 (20.97)	70.9 (17.92)	0.341
Attitude			
Intervention	40.64 (20.61)	75.45 (17.21)	<0.001
Control	38.57 (20.55)	40.38 (20.3)	0.15
Self-efficacy			
Intervention	56.21 (12.34)	75.9 (11.15)	<0.001
Control	53.78 (14.87)	54.79 (14.45)	0.245
Reinforcing factors			
Intervention	25.05 (17)	58.38 (13.39)	<0.001
Control	22.22 (21.06)	22.62 (20.16)	0.622
Social support			
Intervention	78.63 (22.52)	92.27 (13.71)	<0.001
Control	68.86 (29.35)	68.22 (29.18)	0.234

predisposing factors (knowledge, attitude, and self-efficacy), enabling and reinforcing factors, anxiety, depression, and family social support, and since there were no statistically significant differences before and after the intervention, it can be indicated that the educational intervention and application of PRECEED model was effective in improving pregnant women's mental health.

Regarding the predisposing factors (knowledge, attitude, and self-efficacy), the mean score of knowledge in the intervention group increased in comparison to the control group after the educational intervention. Similar results were obtained by Yates et al., who sought to improve cancer pain management by conducting an educational intervention in accordance to the PRECEDE model. Women's knowledge increased in the intervention group compared to the control group after the educational intervention.[30] Pregnant women's attitude towards pregnancy before the educational intervention was the same in both groups (positive); however, after the educational intervention, pregnant women's attitude towards pregnancy improved in the intervention group as compared to the control group, which represented the effectiveness of the educational intervention. Other studies have also shown the effect of education on attitude, for example in Oruoji's study, mother's attitude regarding anemia increased, also in Hazavehei's study, attitude score increased for patients after bypass surgery.[31,32] Pregnant women's self-efficacy mean score increased in the experimental group compared to the control group after the educational intervention, which corresponded to Bastani et al., study.[19] Regarding the access to enabling factors after the educational intervention, 78.2% of the control group and 100% of the intervention group claimed to have had access to training resources and obtained information. Nonetheless, before the intervention, 73.7% of the control group and 61.4% of the intervention group have had access to training resources, which again represented the effect of educational intervention in the intervention group. The increase in the enabling factors in the present study was due to holding training classes, designing educational pamphlets by the instructor, and the relaxation exercises. These results are consistent with Hazavehei et al.,[32], Meshki et al.,[33] and Jimba.[34] The use of non-medical methods and relaxation techniques is an efficient method in controlling stress and anxiety and increasing pregnant women's mental health, which were shown both in the present research and Field et al study.[35] in United States, and Bastani et al.[19]

After the educational intervention, the reinforcing factors (e.g. encouragement of others and relatives, etc.) increased in the intervention group compared to the control group, which was consistent with the study of Hazavehei et al.[32] and Meshki et al.[33] Similar to the results of many other studies with the aim of reducing caesarean section, the increase of reinforcing factors represented the positive impact of non-governmental groups and mass participation of people in the present study.[32-34]

There was no statistically significant difference between social support of pregnant women and support of their families in both groups before the educational interventions, but similar to Daisuke et al.,[36] and Sheng et al., studies, the difference was significant after the educational intervention.[37] The mean score of depression and total anxiety of pregnant women before the educational intervention was insignificantly different, but after the educational intervention, the difference was significant, which is consistent with Lesan[38] and Hazavehei et al., results.[32] The limitations of the present study were small sample size of the study, assessing several variables at the same time with different instruments and also the possible bias of comparing two different urban sections. The strength of the study was using valid and reliable questionnaires. In this research, the researcher was able to achieve considerable results in improving women's mental health. Hence, developing proper educational programs to prevent and decrease stress and anxiety, and incorporating these educational programs in the health system and health centers, is the

most important suggestion that the researcher would like to advance.

Conclusion

The present study showed the positive impact of educational intervention programs based on PRECEED model and major components on reducing anxiety and depression, and finally mental health promotion in the studied population.

Acknowledgments

We kindly like to thank all the individuals who participated in this study.

Ethical issues

This study was approved by Board of Ethics Committee, Tabriz University of Medical Sciences (approval number: 5/4/10268-17/02/2017). Informed consent was obtained from the participants included in the research. All procedures performed in study were in accordance with the ethical standards of the institutional and national research committee.

Conflict of interest

The authors declare no conflict of interest in this study.

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