

Comparison of the Effect of Teaching an Educational Package to Spouses Using Two Methods of In-Person and Distance Education in Childbirth Preparation Classes on Pregnant Women's Mental Health

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ARTICLE INFO

ABSTRACT

Article type:
Original article

Article History:
Received: 14-Apr-2021
Accepted: 19-May-2021

Key words:
Mental Health
Spouses' Educational Package
In-person Education
Distance Education
Pregnant Women

Background & aim: Spouses' participation in childbirth preparation classes seems to be effective in the promotion of pregnant women's mental health. Considering the barriers to spouses' participation in these classes, this study aimed to determine the effect of teaching an educational package to spouses using two methods of in-person and distance education in childbirth preparation classes on pregnant women's mental health.

Methods: This quasi-experimental study was conducted on 102 pregnant women and their husbands in health centers of Mashhad, Iran, in 2019. The subjects were randomly assigned to three groups of in-person education (n=35), distance education (n=33), and control (n=34). In the in-person education group, spouses attended in the third and eighth sessions. In the distance education group, an educational package was delivered to spouses, followed by follow-up calls within three weeks to resolve possible ambiguities. In the control group, the spouses did not receive any training. Pregnant women's mental health was assessed by the General Health Questionnaire-28 before, immediately after, and three weeks after the intervention.

Results: The mean scores of mental health in the three groups did not differ before the intervention ($P < 0.05$). In the distance education group, the mean scores of mental health decreased by 16.1 and 20.1 after the intervention and in the follow-up stage, compared to the control group ($P < 0.001$). In the in-person education group, there were no significant changes in the scores in any stages of pre-intervention, post-intervention, and follow-up, compared to the control group ($P < 0.05$).

Conclusion: Distance education of spouses in childbirth preparation classes was more effective in the promotion of pregnant women's mental health, compared to in-person education.

► Please cite this paper as:

Rahmanian F, Seifi F, Tafazoli M, Tatari M. Comparison of the Effect of Teaching an Educational Package to Spouses Using Two Methods of In-Person and Distance Education in Childbirth Preparation Classes on Pregnant Women's Mental Health. *Journal of Midwifery and Reproductive Health*. 2021; 9(3): 2853-2862. DOI: 10.22038/jmrh.2021.57045.1694

Introduction

Mental health is recognized as one of the key psychological concepts and one of the major issues in the development and prosperity of family and society. Pregnancy, childbirth, and

the postpartum period are critical periods in women's lives, and parental psychological changes initiate since pregnancy (1). Although motherhood is one of the most enjoyable and

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critical events in women's lives, it can be associated with some degrees of mental disorder due to subsequent physical and psychological changes (2). During pregnancy and childbirth, dramatic changes occur in women's emotions, making them highly sensitive to psychological stimuli and sometimes presenting them with serious problems (3).

In fact, pregnant women are at a higher risk of reduced mental health during this period due to their susceptibility to various types of stressors (4). During pregnancy, emotions, family relationships, and responsibilities of parents change and they adapt differently to these alterations. Physical and hormonal changes may cause mood swings, instability of emotions, and transient emotional states. Biochemical factors, hormones, and life stressors, such as fetal health, child care, lifestyle changes, and fear of labor pain affect the mental health of pregnant women (5).

Maternal anxiety during pregnancy increases spontaneous preterm delivery and low birth weight of neonates (6). The results of a study conducted by Pakmanesh pointed to a relationship between maternal mental health and birth weight (1). Among the mental disorders during pregnancy, we can refer to depression, isolation, anxiety, morbid fear, substance abuse, emotional instability, irritability, as well as sleep and sexual disorders (7). Stress in pregnant women results in elevated levels of cortisol which disrupts blood flow to the fetus through the placenta; consequently, the fetus cannot receive sufficient oxygen and nutrients. Moreover, it can exert indirect effects, sometimes posing a serious risk to the mother and fetus during pregnancy.

Changes in hormonal concentrations are responsible for the mood swings occurring during pregnancy (8). Maternal mental disorder, which is a major health concern, is accompanied by several consequences, including preterm delivery and low birth weight (10). Mothers with poor mental health during pregnancy are more prone to preeclampsia, physical problems, and postpartum depression (10). In addition, the need for spinal anesthesia, cesarean section, and instrumental delivery increases (11). The timely identification of these disorders and

psychiatric treatment result in an appropriate response to treatment and the prevention of negative consequences (12).

Today, in health centers or health homes, all women are screened for mental health during pre-pregnancy, pregnancy (at least once at the second visit), and the postpartum period (at least once at the third visit). Mental health screening accelerates the diagnosis of mental disorders (13). Given the positive impact of support from spouses, family, friends, and neighbors on pregnant women's perceived stress, it is necessary that health care professionals pay more attention to the promotion of social support during pregnancy (14).

Pregnancy is one of the critical periods in the life of every woman, and the participation of men plays a peculiar role in the promotion of pregnancy care, as well as maternal and newborn health (15). One of the important strategies for the physical, mental, and psychological health of women during pregnancy is the participation and support of pregnant women's close relatives, especially their spouses (16). The results of a study performed by Sanati et al. indicated that the education of pregnant women and their husbands improves lifestyle. Moreover, simultaneous education of pregnant women and their husbands is more effective than women's education alone (17). In fact, support from a spouse and family is regarded as one of the effective strategies for the mitigation of maternal anxiety during pregnancy (18).

Women demonstrate more emotional needs and special concerns during pregnancy. This highlights the necessity of spouses' love and attention to reduce maternal stress and anxiety and pave the ground for proper fetal development (19). Men's cooperation in prenatal care provides good opportunities for them to perform a major and positive role in the health of their spouses and neonates and be prepared to adapt to their new role as parents (20).

Lack of emotional support from the spouse is the most important risk factor for postpartum depression (21). In a study conducted in Nepal, the participation of spouses in childbirth preparation classes increased mothers' mental health score, compared to the control group in which only mothers attended the classes (22). Based on a division, the educational method is divided into

two methods of in-person and distance education. The training are presented in two ways (mandatory presence of the learner in a specific place and time) and distance education (transfer of knowledge and experience through multimedia and learners' effective training without the need to attend the class) (23).

Preparation for childbirth using educational and psychological skills is an appropriate way to reduce the consequences of delivery, including the request for cesarean section (24). In distance education, knowledge and experience are available through multimedia tools and applications so that learners can receive education and training without the need to attend classes (25). The distance education method includes the provision of educational materials, such as pamphlets and educational booklets, and multimedia education via CD, telephone, internet, or virtual social networks (26).

The current policies of the Ministry of Health in our country have focused on the increase of population; nonetheless, there are some obstacles to the optimal implementation of these policies. Moreover, there are some barriers to spouses' participation in pregnancy care and in-person education in Covid-19 pandemics. Furthermore, no study has compared in-person and distance education of spouses to promote the mental health of pregnant women. In light of the aforementioned studies, the present study aimed to determine the effect of teaching an educational package to spouses using two methods of in-person and distance education in childbirth preparation classes on pregnant women's mental health.

Materials and Methods

This quasi-experimental study was approved by the Ethics Committee of Golestan University of Medical Sciences (IR.GOUMS.REC 1398.267). It was conducted on 102 pregnant women and their husbands who participated in childbirth preparation classes held by health centers 1, 2, and 3 in Mashhad, From December 2019 to May 2020. The sample size was calculated at 23 cases in each group based on the study by Nosrati et al. In 2017, a 95% confidence level, and a test power of 80% (27). Nonetheless, since three groups were recruited in the study, the final sample size in each group was calculated at 33 cases using the formula $n^* =$

$n\sqrt{(g-1)}$ where g is the number of groups studied. This number increased to 37 cases in each group considering 10% sample attrition, making a total of 111 participants.

$$n = \frac{(z_{1-\alpha/2} + z_{1-\beta})^2 (s_1^2 + s_2^2)}{(\mu_1 - \mu_2)^2}$$

In order to prevent the interaction of participants in the three groups, each center was randomly assigned to one group. The names of all three centers were written on a separate sheet and placed in a lottery bag. Since sampling was performed systematically, number 4 was determined as number K , which was obtained by dividing the number of the statistical population in each center by the estimated number of samples in each group. Thereafter, number 3 was selected from among 1 to K based on simple randomization. Therefore, the third woman in the list used in childbirth preparation classes was selected as the first subject, and she was contacted via phone call.

Before the commencement of the study, the pregnant woman and her husband were provided with the aims of the study, and written informed consent was obtained from them. The next sample was selected by adding the number K to the first randomly determined number. That is to say, number 7 was selected from the list of pregnant mothers and this process continued until data saturation. In the case of the unwillingness of the woman or her husband to participate in the research, the next person on the list was selected and called.

The subjects were randomly assigned to three groups of in-person education ($n=35$), distance education ($n=33$), and control ($n=34$). The inclusion criteria for pregnant women were as follows: Iranian nationality and residing in Mashhad, a clean bill of health issued by a doctor or midwife to participate in childbirth preparation classes, Gestational age based on the first day of the last menstrual period (LMP) and ultrasound scans at 28-32 weeks, the age range of 18-35 years, singleton pregnancy, ability to read and write, no history of mental health problems, no history of grief and traumatic events in the last six months, no history of acute or chronic medical illness, no

current high-risk pregnancy, and no history of infertility.

Moreover, the inclusion criteria for spouses entailed: the ability to read and write, monogamy, no history of drug addiction and alcoholism, no history of mental health problems, no history of traumatic events during the last six months. On the other hand, the exclusion criteria were as follows: unwillingness to continue participation in the study, the emergence of pregnancy complications during the study, the occurrence of traumatic events during the study, and the absence of the spouse in more than one training session.

Pregnant women in all three groups participated in childbirth preparation classes. In the in-person education group, pregnant women's husbands also participated in the third and eighth sessions of childbirth preparation classes. In the distance education group, an educational package, including a booklet and CD, was delivered to the spouses by the researcher. Subsequently, the researcher called the husbands three times a week to resolve their possible ambiguities regarding the content of the educational package. In the control group, the spouses did not receive any training. The educational package provided to the distance education group was exactly the same in content as the one used in in-person classes.

Demographic characteristics form and the General Health Questionnaire-28 (GHQ-28) developed by Goldberg were completed by pregnant women in three stages: before, immediately after the intervention, and three weeks after the intervention. The GHQ-28 was developed by Goldberg in 1972 and examines a person's mental state over the past month in four areas: somatic

symptoms, anxiety and insomnia, social dysfunction, and depression). The items are scored on a four-point Likert scale (0, 1, 2, 3), with the scores ranging from 0-84. A lower score is indicative of better mental health. Moreover, total scores of 23-40 are labeled as mild, 41-60 moderate, and 61-84 severe psychiatric disorders (28).

Goldberg and Williams (1988) obtained the split-half reliability of this questionnaire as 0.95 in a study conducted on 853 subjects (29). This questionnaire has also been used in Iran, and its validity and reliability have been confirmed. Taghavi obtained the reliability coefficients of 0.93, 0.70, and 0.90 for the GHQ-28 based on three methods of test-retest, split-half, and Cronbach's alpha respectively. In the study by Taghavi et al. (2002), the validity of this questionnaire was determined and Cronbach's alpha coefficient of this instrument was reported to be within 0.78-0.93 (30).

Furthermore, in their study, Nazifi et al. (2013) aimed to determine the validity, reliability, and factor structure of the Persian version of the GHQ-28. They demonstrated that different subscales of this questionnaire have high internal consistency. Cronbach's alpha coefficient of all subscales of this questionnaire was higher than 0.74 (31). The validity of the personal-fertility characteristics form of the couples was determined through content validity. That is to say, after the approval and necessary corrections of the supervisor and consultant, these two forms were provided to five professors of School Of Nursing And Midwifery, Golestan University of Medical Science and two members of School of Nursing and Midwifery, Mashhad University of Medical Sciences for further revision.

Table 1. Educational content of the spouses' in-person sessions and the educational package provide to spouses in the distance education group

| Sessions of childbirth preparation classes held with the presence of spouses | Title of the taught materials |
|--|--|
| Third session | Mental health, the role of the spouse, mood swings, calmness and relief, fetal growth and development, how to communicate with the fetus, marital relationship, paternal role (90 min) |
| Eight session | Preparing for childbirth, preparing for the hospital, a good and excellent husband, a video on breastfeeding, educational video on neonate care (90 min) |

After the implementation of necessary suggestions and corrections, the final tool was used. Data were analyzed in SPSS software (version 16) using the Kolmogorov-Smirnov test, chi-square test, one-way analysis of variance, and repeated measures of analysis of covariance. A p-value of less than 0.05 was considered statistically significant (Table 1).

In the distance education group, the educational package included the aforementioned contents, which were prepared in the form of booklets and CDs containing educational videos on neonatal care and breastfeeding. The topics covered in the training package were exactly the same as educational content provided in in-person sessions.

Results

The mean age scores of pregnant women in the three groups of in-person, distance education, and control were reported as 28.4 ± 6.24 , 27.36 ± 5.39 , and 25.68 ± 4.86 years, respectively. Moreover, the mean age scores of their husbands were 32.26 ± 5.61 , 31.88 ± 5.4 , and 29.91 ± 4.75 years, respectively, and the two groups were homogeneous in this respect ($P >$

0.05). Moreover, there was no significant difference among the three groups in terms of gravida and gestational age ($P > 0.05$). The highest level of education, which was above diploma, was observed in the in-person group (65.7%). On the other hand, the lowest level of education, which was below diploma, was reported in the distance education group (57.6%) and control (70.6%).

There was a significant difference in terms of education between the three groups ($P = 0.009$); nonetheless, the three groups did not differ regarding maternal occupation ($P = 0.056$). Living with other people ($P = 0.99$) and housing status ($P = 0.52$) were not significantly different among the three groups. The majority of spouses in two groups of in-person teaching (51.4%) and distance education (72.7%) were free-lancers, whereas most of the controls were employees (58.8%). The three groups were significantly different in terms of spouses' occupation ($P = 0.03$); nonetheless, they did not differ in income level and housing status. The results of the present study were reported by controlling confounding variables.

Table 2. Mean and standard deviation of mental health scores and its dimensions in three groups of in-person, distance education, and control

| Dimensions of mental health | In-person education group Mean \pm SD | Distance education group Mean \pm SD | Control group Mean \pm SD |
|------------------------------|--|---|--------------------------------|
| Physical symptoms | | | |
| Pre-intervention | 6.71 \pm 3.80 | 7.69 \pm 3.82 | 8.08 \pm 3.84 |
| Post-intervention | 6.62 \pm 4.42 | 4.9 \pm 2.79 | 9.5 \pm 4.14 |
| Follow up | 7.74 \pm 4.41 | 4.21 \pm .48 | 9.64 \pm 2.99 |
| Anxiety | | | |
| Pre-intervention | 8.42 \pm 4.65 | 8.57 \pm 4.21 | 9.4 \pm 4.3 |
| Post-intervention | 8.80 \pm 5.42 | 3.63 \pm 3.38 | 9.61 \pm 4.58 |
| Follow up | 10.42 \pm 5.43 | 3.45 \pm 2.75 | 10.52 \pm 3.89 |
| Social dysfunction | | | |
| Pre-intervention | 8.77 \pm 3.29 | 7.57 \pm 2.3 | 8.61 \pm 3.05 |
| Post-intervention | 8.2 \pm 3.35 | 3.93 \pm 2.37 | 9.02 \pm 2.83 |
| Follow up | 9.14 \pm 2.89 | 4.8 \pm 2.81 | 9.6 \pm 2.18 |
| Depression | | | |
| Pre-intervention | 2.42 \pm 2.54 | 1.84 \pm 2.1 | 2.58 \pm 2.79 |
| Post-intervention | 2.31 \pm 2.47 | 1.13 \pm 0.66 | 2.7 \pm 2.05 |
| Follow up | 3.87 \pm 3.08 | 1.24 \pm 1.06 | 3.32 \pm 2.8 |
| Overall mental health | | | |
| Pre-intervention | 26.34 \pm 11.43 | 25.69 \pm 9.29 | 28.7 \pm 9.6 |
| Post-intervention | 25.94 \pm 12.87 | 13.15 \pm 8.36 | 30.85 \pm 10.4 |
| Follow up | 30.4 \pm 13.39 | 12.9 \pm 6.76 | 33.11 \pm 8.37 |

In all dimensions of mental health, a more significant decrease was observed in scores obtained in the distance education group, as compared to those reported in two groups of in-person education and control (Table 2). Based on the results of repeated measures ANCOVA with control of the effect of time before the intervention in the three groups, a significant

difference was observed in reducing the adjusted scores of the distance education group after the intervention and at follow-up, compared to the control group ($P < 0.001$). However, there was no statistically significant difference in the spouses' in-person education group, compared to the control group ($P > 0.05$) (Table 3).

Table 3. Results of repeated measures of analysis of covariance in two groups of in-person and distance education

| Stage of the study | Method of education | B | Standard Error | Partial Eta Squared | P-value |
|------------------------------|---------------------|--------|----------------|---------------------|---------|
| Physical symptoms | | | | | |
| Post-intervention | In-person | -1.18 | 1.12 | 0.023 | 0.29 |
| | Distance education | -4.21 | 1.01 | 0.194 | <0.001 |
| Follow up | In-person | -1.1 | 0.99 | 0.018 | 0.26 |
| | Distance education | -5.53 | 0.89 | 0.311 | <0.001 |
| Anxiety | | | | | |
| Post-intervention | In-person | 0.5 | 1.25 | 0.001 | 0.68 |
| | Distance education | 5.34 | 1.14 | 0.233 | <0.001 |
| Follow up | In-person | 0.25 | 1.21 | 0 | 0.94 |
| | Distance education | -7.9 | 1.1 | 0.334 | <0.001 |
| Social dysfunction | | | | | |
| Post-intervention | In-person | -0.88 | 0.81 | 0.012 | 0.28 |
| | Distance education | -4.89 | 0.75 | 0.315 | <0.001 |
| Follow up | In-person | -0.71 | 0.8 | 0.004 | 0.37 |
| | Distance education | -5.63 | 0.73 | 0.4 | <0.001 |
| Depression | | | | | |
| Post-intervention | In-person | 0.11 | 0.54 | 0 | 0.82 |
| | Distance education | -1.86 | 0.5 | 0.136 | <0.001 |
| Follow up | In-person | -0.4 | 0.74 | 0.008 | 0.58 |
| | Distance education | -2 | 0.68 | 0.112 | 0.004 |
| Overall mental health | | | | | |
| Post-intervention | In-person | -1.8 | 3.03 | 0.005 | 0.68 |
| | Distance education | -16.4 | 2.77 | 0.309 | <0.001 |
| Follow up | In-person | -2.12 | 2.74 | 0.007 | 0.4 |
| | Distance education | -20.08 | 2.51 | 0.433 | <0.001 |

Reference group: control group

Discussion

In the distance education group, the mean scores of mental health showed a decrease of 16.1 and 20.1 units after the intervention and in the follow-up phase, compared to those obtained in the control group ($P < 0.001$). After the intervention and follow-up, the mean scores decreased in the areas of physical symptoms (4.2 and 5.5 units), anxiety and insomnia (5.3 and 7.1 units), social dysfunction (4.9 and 5.6 units), and depression (1.7 and 2 units) in the distance education group, compared to the control group ($P < 0.001$).

In the in-person education group, changes

were not significant in the stages of pre and post-intervention, as well as the follow-up, in comparison with the control group. The results pointed out that distance education of spouses improved mental health and its dimensions in pregnant women after the intervention and in the follow-up phase (three weeks after the intervention). In other words, this method of education improved the mental health of pregnant women and was more effective than in-person education and non-education of spouses.

Along the same lines, Moridi et al. conducted a study to assess the effect of couple education based on the BASNEF model on spouses'

support and mental health of pregnant women. They pointed to the positive effects of this kind of education on the promotion of pregnant women's mental health and spouses' support in the intervention group (32). Some parts of the teaching method used in the intervention group in the aforementioned study were similar to the present study. They initially provided a 60-min training session, followed by a training booklet, and weekly reminder text messages to spouses for four weeks. In fact, they implemented a combination of in-person and distance education methods for husbands and observed a positive effect on the mental health of pregnant women. This result indicated that follow-up can be an effective step to continue education and highlight the importance of this issue.

The results of the studies performed by Nosrati et al. (27), Abbasi et al. (33), Hosseini GHaratekan et al. (34), and Safdari Deh Cheshmeh et al. (35) are in contrast to those obtained in the present research. They pointed to the positive effects of spouses' in-person education during pregnancy on the overall mental health score of pregnant women. Nevertheless, in the present study, spouses' in-person education in childbirth preparation classes was not effective in the mental health of pregnant women.

The results of the abovementioned studies can be justified on the ground that the educational interventions performed on the spouses were performed in more than two sessions, or there was a combination of in-person education with an educational package and follow-up calls or assignments. In their studies, Deh Cheshmeh and Hosseini GHaratekan provided eight training sessions and Nosrati implemented a 120-min training program in three sessions (once a week) using the method of group discussion, lectures, questions and answers, displaying videos, educational booklets, and assignment.

In the study by Moridi, a 60-min session was conducted, along with a booklet and weekly text messages for the intervention group. However, in the present study, in the in-person education group, according to the instructions of the Ministry of Health, the spouses participated only in the second and eighth sessions and were trained on the content of the training package in

the classes. On the other hand, in the distance education group, the training package was delivered to the spouses, followed by weekly follow-up calls for three weeks.

Therefore, in the present study, the ineffectiveness of in-person education of spouses on the mental health of pregnant women can be attributed to the educational method and the low number of sessions in the in-person education group. Regarding distance education, we can refer to a study performed by Ganjali who investigated the effect of this kind of education on pregnant women's fear of mode of delivery in Dezful. Despite the differences in the study population and study tools, the effectiveness of one to eight weekly sessions of distance education confirmed the efficacy of distance education during pregnancy. The results indicated that the anxiety and stress scores of pregnant women before and after the intervention in the experimental group were significantly different from the control group (36).

In the same context, in their study, Masoudi et al. compared the effectiveness of in-person and distance education methods in the reduction of complaints during pregnancy. They concluded that the three educational methods of SMS-based, via telegram, and in-person did not significantly differ and pointed to the usefulness of a combination of virtual methods and in-person education (37). Despite the useful findings of the study by Masoudi's and the similarity between the used method and the present study, a significant difference was that due to inherent limitation in the transfer of educational videos via text messages, educational CDs were given to all three groups: in-person, text message, and telegram.

Therefore, the in-person education method was a combination of in-person and distance education. On the other hand, in the present study, an educational package with the same content was taught in two sessions in the in-person education method and delivered to spouses in the distance education method. One of the strengths of the present study is the recruitment of a control group and making a comparison among the three groups of in-person, distance education, and control. Nonetheless, the aforementioned studies were

conducted on two groups of intervention and control. Although the Covid-19 pandemic imposed numerous problems to all aspects of society, including public health, it resulted in a marked improvement in some capabilities, including the pervasiveness of e-education throughout the country.

It seems that virtual education in our country has entered an entirely new phase and it is receiving more assiduous attention. On the other hand, officials have been aware of the importance of distance and e-education education. Therefore, the growing prosperity of virtual education is expected in the country due to the development of the necessary infrastructures, such as the development of the Internet, the production of interactive educational software, and the use of experiences gained in this pandemic (38).

Among the notable limitations of the present study, we can refer to the self-report nature of the mental health questionnaire which may have affected the responses. Moreover, it is also difficult to control all the factors affecting mental health during pregnancy. Low cooperation of spouses in the in-person intervention group and the length of the study were other limitations in the in-person education method. In the present study, the implementation of a codified educational program for pregnant women's spouses focused on four domains of mental health in general. It is suggested that future studies assess the effect of this program on each domain of pregnant women's mental health separately.

Conclusion

Pregnancy is an appropriate time for mental health interventions. Due to the role of spouses in this regard, despite the valuable participation of spouses in childbirth preparation classes, the low number of sessions held with the presence of spouses (according to the instructions of the Ministry of Health) did not have a positive effect on pregnant women's mental health. Nevertheless, simultaneous distance education of spouses with childbirth preparation classes had a positive effect on pregnant women's mental health.

In the shortage of resources, this type of education can be a good, cost-effective, and efficient alternative to on-site teaching, and

various media, such as text, images, as well as audio and video models are used. Therefore, considering the advantages of this method, the barriers to spouses' participation, and the Covid-19 pandemic as the current crisis in society, the distance educational package for pregnant women's spouses can be a good alternative to their presence in childbirth preparation classes.

The results of the present study can direct the attention of health planners and managers to the role of spouses in the mental health of pregnant women and society. These officials should promote spouses' participation in childbirth preparation classes through various methods (media advertising, posters, brochures, booklets, and CDs). Therefore, it is recommended to prepare a special educational package for spouses and present it to them simultaneously with childbirth preparation classes, especially in health centers and midwifery counseling centers.

Acknowledgements

Our deepest appreciation goes to all those who accompanied us during the implementation of this research project, especially the Vice-Chancellor for Research and Technology of Golestan University of Medical Sciences, Buyeh School of Nursing and Midwifery, the Vice-Chancellor for Health of Mashhad University of Medical Sciences, all health care providers and midwives of health centers in Mashhad, pregnant women, and their spouses.

Conflicts of interest

Authors declared no conflicts of interest.

References

1. Pakmanesh F, Hamidia A, Faramarzi M, Shirafkan H, Mehrabani S. The Relationship between Maternal Mental Health and the Development of Infants under One Year of Age. *Journal of Babol University of Medical Sciences*. 2021; 23(1): 29-37.
2. Sehhatie Shafaie F, Mirghafourvand M, Rahmati M, Nouri P, Bagherinia M. Association between psychological status with perceived social support in pregnant women referring to Tabriz health centers. *The Journal of Maternal-Fetal & Neonatal Medicine*. 2018; 31(12): 1554-1560.
3. Zahedpasha Y, Salarmanesh A, Khafri S, Mouodi S, Arzani A. The Effect of Kangaroo Mother Care on Mental Health of Mothers with Premature Infants.

- Journal of Babol University of Medical Sciences. 2018; 20(6): 7-13.
4. Bales M, Pambrun E, Melchior M, Glangeaud-Freudenthal N-C, Charles M-A, Verdoux H, et al. Prenatal psychological distress and access to mental health care in the ELFE cohort. *European Psychiatry*. 2015; 30(2): 322-328.
 5. Cunningham F, Leveno K, Bloom S, Spong CY, Dashe J. *Williams obstetrics*, 24e. New York, NY, USA: Mcgraw-hill; 2014.
 6. Nasiri Amiri F, Salmalian H, Hajiahmadi M, Ahmadi A. Association between Prenatal Anxiety and Spontaneous Preterm Birth. *Journal of Babol University of Medical Sciences*. 2009; 11(4): 42-44.
 7. Kaplan BJ. Kaplan and sadock's synopsis of psychiatry. Behavioral sciences/clinical psychiatry. *Tijdschrift voor Psychiatrie*. 2016; 58(1): 78-79.
 8. Adel A, Basaknejad S, hamid N, Davoudi I. The Effectiveness of Mental Health Training of Mother and Child on Pregnancy Anxiety and Mental Health of Primigravida Mothers. *Nursing and Midwifery Journal*. 2018; 16 (8): 583-592.
 9. Marcus SM. Depression during pregnancy: rates, risks and consequences. *Journal of Population Therapeutics and Clinical Pharmacology*. 2009; 16(1):15-22.
 10. Andersson L, Sundström-Poromaa I, Bixo M, Wulf M, Bondestam K, Åström M. Point prevalence of psychiatric disorders during the second trimester of pregnancy: a population-based study. *American journal of obstetrics and gynecology*. 2003; 189(1): 148-154.
 11. Chung TK, Lau TK, Yip AS, Chiu HF, Lee DT. Antepartum depressive symptomatology is associated with adverse obstetric and neonatal outcomes. *Psychosomatic Medicine*. 2001; 63(5): 830-834.
 12. Jandaghi F, Saeidinik M, Hedayati SH. Mental health in pregnancy. *Behvarz*. 1399; 31(104):12-127.
 13. Fekadu A, Hanlon C, Medhin G, Alem A, Selamu M, Giorgis TW, Shibre T, Teferra S, Tegegn T, Breuer E, Patel V. Development of a scalable mental healthcare plan for a rural district in Ethiopia. *The British journal of psychiatry*. 2016; 208(56): 4-12.
 14. Faramarzi M, Pasha H. The Role of Social Support in Prediction of Stress During Pregnancy. *Journal of Babol University of Medical Sciences*. 2015; 17(11): 52-60.
 15. Motlagh M, Torkestani F, Ashrafian Amiri H, Rabiee S, Radpooyan L, Nasrollahpour Shirvani S, et al. Iranian Husbands' Involvement in Prenatal Care, Childbirth and Postpartum: Viewpoints of the Mothers. *Journal of Babol University of Medical Sciences*. 2017; 19(5): 23-31.
 16. Leifer G. *Maternity nursing: an introductory text*, 10th edition .Saunders Company, Philadelphia, USA; 2008.
 17. Sanaati F, Mohammad-Alizadeh S, Mirghafourvand M, Alizadeh Sharjabadi F, Galeshi M. The Effect of Training Pregnant Women and Their Husbands on Health Promoting Behaviors during Pregnancy and Postpartum Period. *Journal of Babol University of Medical Sciences*. 2018; 20 (5): 38-47.
 18. Borghei NS, Taghipour A, Latifnejad Roudsari R. Pregnant mothers' strategies for the management of pregnancy concerns. *Journal of hayat*. 2017; 23(2): 106-125.
 19. Kutcher S, Wei Y, McLuckie A, Bullock L. Educator mental health literacy: a programme evaluation of the teacher training education on the mental health & high school curriculum guide. *Advances in school mental health promotion*. 2013;6(2):83-93.
 20. Fathnezhad Kazemi A, Sharifi N, Simbar M. A Review on different aspects of men's participation in antenatal care. *Jorjani Biomedicine Journal*. 2017; 5(1):13-21.
 21. Xie RH, He G, Koszycki D, Walker M, Wen SW. Prenatal social support, postnatal social support, and postpartum depression. *Annals of epidemiology*. 2009; 19(9): 637-643.
 22. Mullany BC. Barriers to and attitudes towards promoting husbands' involvement in maternal health in Katmandu, Nepal. *Social science & medicine*. 2006; 62(11): 2798-809.
 23. Nastiezaie N, Hezare Mogadam M. A comparative survey on effects of face to face and distanced short term training courses on staff's psychological empowerment. *The Journal of Urmia Nursing and Midwifery Faculty*. 2011; 8(4): 254-65.
 24. Khoursandi M, Vakilian K, Torabi Goudarzi M, Abdi M. Childbirth Preparation using Behavioral-Cognitive Skill in Childbirth Outcomes of Primiparous Women. *Journal of Babol University of Medical Sciences*. 2013; 15(4): 76-80.
 25. Farahani M. Investigating the Costs and Comparison of the Quality of Physical Education Training in the Distance Education System. *Harkat*. 2001; 5(8): 5-25. [Persian]
 26. Baraz S, Mohammadi I, Boroumand B. A comparative study on the effect of two methods of self-care education (direct and indirect) on quality of life and physical problems of hemodialysis patients. *Journal of Arak University of Medical Sciences*. 2006; 9(1): 7-22.
 27. Nosrati A, Mirzakhani K, Golmakani N, Asghari Nekah M, Esmaeili H. Effect of Paternal-Fetal Attachment on Maternal Mental Health: A Randomized Clinical Trial. *Journal of Mazandaran*

- University of Medical Sciences. 2017; 27(152): 50-62.
28. Zarea K, Bahrani H. Study of mental health in status the operation room students who are
 29. Bridges KW, Goldberg DP. The validation of the GHQ-28 and the use of the MMSE in neurological in-patients. *The British Journal of Psychiatry*. 1986; 148(5): 548-553.
 30. Taghavi S. Validity and reliability of the general health questionnaire (ghq-28) in college students of shiraz university. *Journal of psychology*. 2002; 5(4): 381-398.
 31. Nazifi M, Mokarami H, Akbaritabar A, Faraji Kujerdi M, Tabrizi R, Rahi A. Reliability, Validity and Factor Structure of the Persian Translation of General Health Questionnaire (GHQ-28) in Hospitals of Kerman University of Medical Sciences. *Journal of Fasa University of Medical Sciences*. 2014; 3(4): 336-342.
 32. Moridi A, Modarres M, Moghadam ZB, Forooshani AR. The Effect of Education Program of the Couples Based on the BASNEF Model on Spousal Support and Mental Health of Pregnant Women. *Global Journal of Health Science*. 2016; 9(6): 88-96.
 33. Abbasi P, Mohammad-Alizadeh Charandabi S, Mirghafourvand M. Comparing the Effect of Educational Software and Booklet on Knowledge Level Regarding Labor Pain Management: A Randomized Controlled Clinical Trial. *International Journal of Women's Health and Reproduction Sciences*. 2017; 5(3): 218-223.
 - educating in Ahvaz Jundishapur University of Medical Science in 2011. *Jentashapir Journal of Cellular and Molecular Biology (Jentashapir Journal of Health Research)*. 2013; 4(1): 23-31.
 34. Gharateka H, Mohammad S, Emami Moghandam Z, Golmakani N, Vashshani B, Reza H. Effect of Spouses' Educational Program on Quality of Life of their Pregnant Wives. *Journal of Mazandaran University of Medical Sciences*. 2017; 27(155): 170-175.
 35. Safdari Dehcheshmeh F, Salehian T, Parvin N. The effect of spouses' educational classes held for primiparous women referring to Hajar hospital on their quality of life and pregnancy outcomes. *Iranian journal of nursing and midwifery research*. 2014;19(7): 59-63.
 36. Alijani H, Borghei NS, Behnampour N. FOC in Pregnancy and Some of its Effective Factors. *Journal of Research Development in Nursing and Midwifery*. 2019;16(1):59-68.
 37. Masoudi F, Mehri A, Esmaily H, Hashemian M. Comparison of the Effectiveness of Text-Based on Education, Telegram and In-person Training on Reducing Common Complications in Pregnancy. *Journal of Sabzevar University of Medical Sciences*. 2019; 26(3): 365-372.
 38. Ghafourifard M. The promotion of Virtual Education in Iran: The Potential which Turned into reality by Coronavirus. *Iranian Journal of Medical Education*. 2020; 20(4): 33-34.