



The effect of health promotion package based on BASNEF model on self-efficacy and parenting stress in primiparous pregnancy: A clinical trial study

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Abstract:

BACKGROUND: Being a mother is one of the most important events in a woman's life, which is accompanied by change, instability, and reorganization of life for parenthood. The aim of this study was to investigate the effect of educational package based on health promotion model on self-efficacy and parenting stress during postpartum in primiparous pregnancy

MATERIALS AND METHODS: This research was a three-stage, randomized, two-group clinical trial (pre-intervention, after intervention, and third-postpartum visit). The intervention was conducted four 2-hour online sessions, virtual discussion groups, and one individual education session. The data collection tools included the standard Parenting Stress Index (PSI) questionnaire and the Sherer's General Self-Efficacy Scale (GSES) questionnaire. Data were analyzed by SPSS statistical software (version 22) using descriptive statistics independent *t*-test, Mann-Whitney, repeated measures analysis of variance (ANOVA), and chi-square tests.

RESULTS: There was no significant difference in demographic and fertility variables and the mean scores of parenting stress and self-efficacy before intervention between the two groups ($P > 0.05$). In the intervention group, the mean scores of self-efficacy and parenting stress were significantly higher and lower, respectively, in the immediate postintervention and the third follow-up visits compared with before intervention ($P < 0.001$). In the control group, the mean score of parenting stress was significantly lower in the third follow-up visit ($P < 0.001$), but no significant difference was observed in self-efficacy scores between before and after intervention ($P > 0.05$).

CONCLUSION: It appears that health promotion model, with its focus on identifying attitudes, abstract norms, and enabling factors, is an effective pattern for teaching health and individual processes such as parenting stress and self-efficacy.

Keywords:

BASNEF Model, health promotion, parenting stress, postpartum, self-efficacy

Introduction

Being a mother is one of the most important events in a woman's life that is accompanied by changes, instability, and a reorganization of life.^[1] This 6- to 8-week transition to parenthood includes significant psychological, physiological,

and social changes that can be stressful for parents.^[2] High levels of maternal anxiety and depression may have harmful effects on both the mother and her child,^[3,4] and these mood symptoms are associated with preterm birth,^[5] infant irritability, and long-term behavioral and emotional problems in the child.^[6] Parenting stress

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may affect the mother–infant attachment style.^[7] In the postpartum period, the adaptation to stress associated with new parenting roles, additional responsibilities of caring for the infant, and lack of social support from the partner can have a negative impact on the parent–infant bond, which may affect the growth and attachment of the child.^[8-10]

When parents are able to manage their emotions and respond to a crisis, they are generally more likely to take better care of their children.^[11] Since mothers are usually responsible for parenting and family health, coping strategies are very important to help mothers adapt to parenting stress and gain confidence in solving difficult situations.^[12] According to McCubbin *et al.*,^[13] responding to stressful situations by using psychological, social, and material resources is useful for proper stress management so that the family perceives stress as a positive factor and overcomes it.^[14]

The stress of parents is caused by their perception of their competency in the parenting role, as well as their understanding of their child's behavior. Parenting self-efficacy is recognized as a primary determinant of parenting behaviors and has a close relationship with the outcomes of children's growth and social–emotional adjustment.^[15,16] Maternal self-efficacy is one of the psychological factors that has often been identified as a protective factor against stress and depression symptoms.^[16-18] Past studies have shown that first-time mothers have higher levels of confidence and stress than mothers of multiple children.^[19,20] A high level of perceived self-efficacy and social support help ease the transition into parenthood and reduce the risks of postpartum depression and anxiety.^[21-23] Therefore, the vital role of self-efficacy in creating a positive parenting experience is evident.^[24,25]

Theories and educational models of health promotion have the responsibility of identifying and defining obstacles to behavior change and adapting them to the existing social–cultural contexts.^[26,27] When conducting educational interventions, the use of behavioral theories such as the health belief model, the trans theoretical model, the reasoned action theory, social support, and the diffusion of innovation theory can create potential capacity for the effectiveness of these interventions.^[28,29] One of the functional health promotion theory in education is BASNEF; the stages of this model include Belief, Attitude, Subjective Norms, and Enabling Factors (BASNEF) model, which was developed by John Hubley based on the PRECEDE model in 1988, and have been adapted to meet the specific health education needs of developing countries.^[26] The combination of attitudes and mental norms leads to the formation of behavioral intentions for performing a new behavior.^[30,31] Therefore,

the aim of this study was the Effect of Health Promotion Package Based on BASNEF Model on Self-Efficacy and Parenting Stress in Primiparous Pregnancy.

Methodology

Study design and setting

This research was a clinical trial with three stages (preintervention, after the intervention, and the third visit to the postpartum).

Study participant and sampling

The study population consisted of all mothers referred to the comprehensive health service centers of Isfahan University of Medical Sciences who met the study inclusion criteria.

Inclusion and exclusion criteria

The inclusion criteria were being Iranian, having at least elementary education, willingness to cooperate, being a Primiparous mother, not having severe psychological and physical disorders or any diseases that could prevent taking care of the infant (which can be checked in the SIB system in comprehensive health centers), having access to virtual facilities, and having a healthy newborn who is kept at home. The exclusion criteria were absence of more than one session in training sessions, unwillingness to continue the study, failure to fully respond to questionnaires, the occurrence of any disease in the newborn who was admitted to the hospital during the study.

Cochran's formula was used for sample size $N = (z1 + z2) 2(2S2)/d2$. Based on the formula, 40 people in the intervention group and 40 people in the control group were selected as the sample size [Figure 1]. Sampling was performed in 2 months from September to October 2022.

Initially, one health center from two health centers in Isfahan city was selected as a cluster, and then, four health centers were selected from the list of centers using a random number table. Then, in each center, the case of the first call to participate in the study. The control and intervention groups were randomly assigned online randomization at website (www.randomization.com) by a person other than the researcher.

Data collection tools and technique

The data collection tools constructed questionnaires included demographic, fertility and BASNEF constructs including (items of abstract norms and enabling factors), the Parenting Stress Index (PSI), and the Sherer's General Self-Efficacy Scale (SGSES).

Parental Stress Questionnaire (PSI) which has 54 parental questions including subscales depression 9 items,

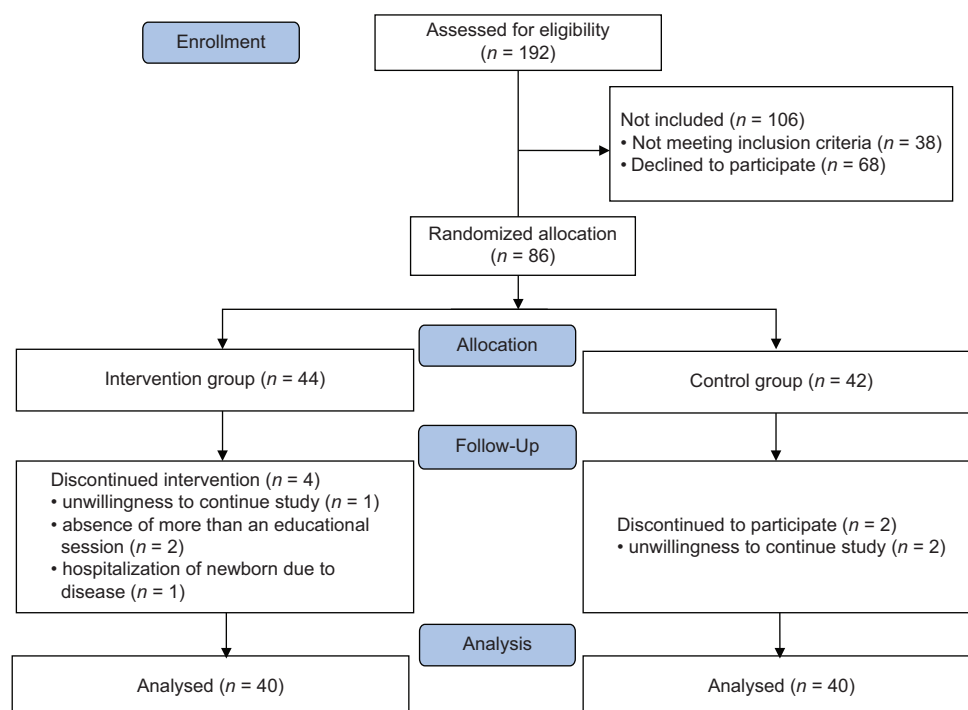


Figure 1: Consort diagram

attachment 7 items, parental role limitations 7 items, sense of competence 13 items, relationship with spouse 7 items, social isolation 6 items, and parental health 5 items. Reliability of PSI was obtained by calculating Cronbach's alpha 0.93. The concurrent validity coefficient of the tool with 5 other different stress tools was between 66 and 38%. The internal consistency of this tool was 0.88, and its retest reliability coefficient with a 10-day interval was reported as 0.94.^[32]

SGSES contains 17 questions that scored strongly disagree 1 to strongly agree 5. The reliability of this questionnaire has been reported through Cronbach's alpha of 0.8–0.91 and construct validity of 0.86.^[33-36]

Ethical consideration

All participants signed a written informed consent form after studying the objectives of the research.

Implementation:

Procedure

In the first stage, awareness: the first stage to participate in the study; they received the amount of internet data to participate in the classes and also gave them the desired physical materials (including CDs, written pamphlets). Then, the training sessions took place in the period of 3 months from November 2022 to January 2023. Based on model, the information provided by the BASNEF structure regarding the virtual training consisted of 4 2-hour online sessions through the Skype program sessions (the mother's training was conducted with

one of the influential people around her, which was extracted from the mothers' primary information) by the researcher (midwifery master's student) and with the supervision and participation of the supervisor (the faculty of the midwifery department and reproductive health) was done. In addition, after each online session, instructional videos and materials related to the content of the session were shared virtually in the mothers' group.

Second stage, Attitude: Virtual groups were formed for interaction and discussion. Mothers were divided into four virtual WhatsApp groups of ten people each to receive educational materials and interact and discuss parental attitudes. The researcher and a university member were present in all these groups to guide the mothers, provide scientific materials, and answer their questions. The group discussion that was expressed by the researcher and the questions and answers of the group members motivated people to participate in the group discussion and participation. The virtual groups were maintained until the third visit of postpartum meetings (30–40 days), and discussion, interaction, and exchange were done by the group members and the researcher.

In the third stage, enabling factors: Individual face-to-face sessions and practical discussions with infant model and mannequins simulators were conducted for mothers and influential person who determined in pretest. These sessions were held individually due to the COVID-19 epidemic individually to comply with health protocols.

Finally, the post-test, was conducted after the completion of the intervention and the third postpartum care visit (30–45 days). At the end, mothers were given a commemorative gift to thank them for participating in the study. In the control group, routine care was performed, and after the intervention, all educational materials in the form of CDs and educational pamphlets were provided to the control group.

Data analysis

Data were analyzed by SPSS statistical software (version 22) using descriptive statistics independent *t*-test, Mann–Whitney, repeated measures analysis of variance (ANOVA), and chi-square tests.

Results

Statistical tests showed that the mean of maternal age was 28.65 years, and most of mothers and their spouses had university education. There is no significant differences in demographic and fertility information between the two groups [Table 1].

In the present study, the main sources of information regarding the newborn and its diseases were the mother and mother-in-law with the highest frequency. In addition, the most effective individuals in relation to infant care were the mother and sister with a higher frequency.

In addition, the mean score of self-efficacy before the intervention did not show a significant difference between the two groups ($P > 0.05$). However, immediately after the intervention and in the third postpartum visit, the mean self-efficacy score in the intervention group was significantly higher than the control group ($P < 0.001$). Repeated-measures ANOVA showed a significant difference in the mean self-efficacy score between the three time points in both groups ($P < 0.001$); however, the mean self-efficacy score in the control group in the third postpartum visit was significantly higher than before the intervention and immediately after the intervention ($P < 0.001$) [Table 2].

Comparison of mean self-efficacy scores within each groups pairwise over time is shown in Table 3 [Table 3].

The results showed a significant difference in the mean score of parental stress between the two groups at all three time points ($P < 0.001$), although this difference was greater in the intervention group than the control group. The mean score of parental stress in the control group was significantly lower at the third visit to the postpartum than before and immediately after the intervention ($P < 0.05$), but there was no significant difference between before and immediately after the intervention ($P > 0.05$) [Table 4].

Table 1: Comparison of characteristics of the participants in the intervention and control groups

Variable	Intervention group	Control group	Statistical test	P
Maternal age (years)*	28/46±4/68	28/85±5/72	$t=0/33$	0/74
Age of spouse (years)*	32/07±3/17	32/32±5/40	$t=0/26$	0/80
Length of marriage (in years)*	4/66±2/43	4/23±2/64	$t=0/75$	0/46
Mother's Education Level**				
Elementary and High school	2 (5%)	6 (15%)	$Z=0/98$	0/33
Diploma	12 (30%)	11 (27/5%)		
University education	26 (65%)	23 (57/5%)		
Spouse's Education Level**				
Elementary school	3 (7/5%)	1 (2/5%)	$Z=0/35$	0/72
High school	2 (5%)	6 (15%)		
Diploma	15 (37/5%)	14 (35%)		
University education	20 (50%)	19 (47/5%)		
Occupation of Mother**		2 (5%)		
Employee	5 (12/5%)		$X^2=1/38$	0/51
Self-employed	8 (20%)	6 (15%)		
housewife	27 (67/5%)	32 (80%)		
Occupation of Spouse***				
Unemployed	1 (2/5%)	0 (0%)	$X^2=1/44$	0/51
Employed	39 (97/5%)	40 (100%)		
Type of residential property***				
Rental	20 (50%)	19 (47/5%)	$X^2=1/63$	0/44
Owner	18 (45%)	16 (40%)		
Living with family members	2 (5%)	5 (12/5%)		
History of infertility**	2 (5/1%)	2 (5/1%)	$X^2=0/0$	0/99
History of abortion and stillbirth***	6 (15%)	8 (20%)	$X^2=0/35$	0/55

*Independent *t*-test. **Mann–Whitney test. ***Chi-squared test

Table 2: Comparison of mean self-efficacy scores between and within the intervention and control groups

Time	Intervention group	Control group	Independent <i>t</i> -test	
	mean±SD	mean±SD	<i>t</i>	<i>P</i>
Preintervention	74/48±10/54	74/31±7/62	0/08	0/94
Immediately postintervention	81/06±6/37	73/05±7/13	6/82	<0/001
Third appointment for postpartum visit	82/64±6/40	75/20±7/14	7/01	<0/001
Repeated-measures analysis of variance (RM ANOVA)	<i>F</i> =57/42 <i>P</i> <0/001	<i>F</i> =10/34 <i>P</i> <0/001		

Table 3: Comparison of mean self-efficacy scores within each of the two intervention and control groups pairwise over time using the LSD follow-up test

Group	Times	<i>P</i>
intervention	Preintervention and immediately postintervention	<0/001
	Preintervention and third appointment for postpartum visit	<0/001
	Immediately postintervention and third appointment for postpartum visit	<0/001
Control	Preintervention and immediately postintervention	0/09
	Preintervention and third appointment for postpartum visit	<0/001
	Immediately postintervention and third appointment for postpartum visit	<0/001

LSD follow-up test for comparison in the mean score of parenting stress at different time points in each groups is shown in Table 5.

Discussion

The present research showed that training using health promotion model such as the BASNEF method can increase the level of parenting self-efficacy. In line with this research, another research showed that women with lower anxiety had higher self-efficacy. Therefore, based on the findings of this research, more attention should be paid to the mental health of postpartum women, a situation that can lead to a longer duration of exclusive breastfeeding with breast milk.^[37] This means that if the necessary interventions can increase the level of parenting self-efficacy, it can take a step toward improving the health of children.

In this research, the question arises as to what could be the reason for the increase in maternal self-efficacy even in the control group in the third care period, i.e., at 40 days. This may question the necessity of training or social support. In response to this issue, it should be noted that becoming a parent is a gradual phenomenon that takes shape from the beginning of pregnancy. On the other hand, in the same third care period, the self-efficacy score of mothers in the intervention group is higher than the control group. This indicates that perhaps many mothers have somewhat reached, the

necessary self-efficacy for their infant in pregnancy and postpartum without having formal training.^[38] However, the self-efficacy score of the trained group is still significantly higher.

Another research has shown that predelivery counseling can increase maternal self-efficacy during lactation and solve most lactation problems in the postpartum period.^[39] Having high self-efficacy for first-time mothers is very important because they will have more parental self-efficacy during delivery and in the early stages afterward, and they will be able to improve their parenting skills and mental health until the first year after childbirth.^[38] The results of this study indicate the significant impact of family and healthcare team support on improving parental self-efficacy and the importance of providing supportive resources to parents.^[40] In addition, parent education results in increased parental self-confidence in infant care and reduced parental stress.^[41]

Regarding parenting stress, it can be concluded that educational interventions and awareness of social norms and enabling factors in mothers can significantly help reduce maternal stress. An important point to note is the impact of secondary education and the significant help of healthcare personnel, especially influential individuals in mothers' lives such as their own mother, sister, mother-in-law, etc. The process of maternal adjustment to new conditions can significantly help improve the symptoms of parental stress, and considering the decreasing trend of parental stress in the control group, this is an important issue.^[29,42] On the other hand, a study in Australia has shown that supporting mothers during the postpartum period, even virtually, have the potential to enhance existing parenting services in addressing parenting challenges.^[43]

These findings are consistent with another study that showed, in addition to maternal awareness, the encouragement and support of spouses, mothers, and mothers-in-law as mental norms have a positive impact on parenting behavior, and the importance of these factors should be considered in postpartum programs.^[44]

These findings are consistent with the results of other studies, and given the alignment with the country's

Table 4: Comparison the mean score of parenting stress index between and within the intervention and control groups

Time	Intervention group	Control group	Independent t-test	
	mean±SD	mean±SD	t	P
Preintervention	124/74±25/84	129/78±25/52	0/77	0/44
Immediately postintervention	91/98±14/41	127/26±22/69	6/17	<0/001
Third appointment for postpartum visit	83/16±9/99	122/2±22/78	7/56	<0/001
Repeated measures analysis of variance (RM ANOVA)	F=56/55 P<0/001	F=14/11 P<0/001		

Table 5: Comparison of the mean score of parenting stress between intervention and control groups at different time points using LSD post hoc test

Group	Times	P
Intervention	Preintervention and immediately postintervention	<0/001
	Preintervention and third appointment for postpartum visit	<0/001
	Immediately postintervention and third appointment for postpartum visit	<0/001
Control	Preintervention and immediately postintervention	0/61
	Preintervention and third appointment for postpartum visit	0/03
	Immediately postintervention and third appointment for postpartum visit	<0/001

population policies, it is expected that by employing innovative educational methods—not just lectures—such as combination approaches and high-efficacy educational interventions, parental stress can be reduced.^[45] It is hoped that by using effective educational models and enhancing the self-efficacy of mothers in childcare, we can turn their first experience into a sweet experience for primiparous mothers and lead to more successful parenting.

Conclusion

It seems that using the BASNEF model by healthcare personnel, health service centers, and midwives, taking into account attitudes, abstract norms, and enabling factors, can be an effective model for training to improve self-efficacy,^[31] reduce parental stress, and promote positive childbirth experiences. This is important given the declining fertility rates and social barriers to childbearing and highlights the need for effective training to address psychological barriers and enhance maternal self-efficacy in this regard.

Limitation and strength

It is possible that economic and social factors that affect parental stress as well as individual differences in people's opinion and motivation are related to the effect of education and cannot be controlled by this researcher. The strengths of this study were using the educational model that educated influential person and spouses additional mothers.

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Ethical approval

After obtaining permission from the Ethics Committee of the Deputy of Research and Technology of Isfahan University of Medical Sciences with ethics code (IR.MUI.NUREMA.REC.1400.085) and registering the study on the IRCT website (IRCT202110921052539N1), the study was conducted.

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Conflicts of interest

There are no conflicts of interest.

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