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The Effect of Empowerment of Grandmother on Depression and Maternal Role Realization in Primiparae with Hospitalized Infant: A Randomized, Controlled, Clinical Trial

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Abstract

Background: Hospitalization of the newborn infant can cause depression crisis and severely undermine the attainment and realization of maternal role in a primipara. The neonate's maternal grandmother can provide the support needed to help the primipara avoid or overcome the ensuing problems.

Aim: This study aimed to investigate the effect of empowerment of grandmothers on depression and maternal role realization in primiparae with hospitalized newborn.

Method: In this randomized, controlled, clinical trial, 84 primiparae with their infants admitted to Shahid Rajaei Hospital of Gachsaran, Iran, were assigned to intervention and control groups. A grandmother empowerment intervention was devised by combining the concepts of Mercer's theory with the stages of Ravanipour's self-management empowerment model. The control group received the routine care. Depression and maternal role realization in all the primiparae were measured with Beck Depression Inventory and a researcher-made role realization questionnaire before and one month after the intervention. Data was analyzed by independent and paired t-test in SPSS, version 18.

Results: The mean ages of the mothers in the intervention and control groups were respectively 27.02 ± 5.3 and 24.0 ± 4.1 years. Before the intervention, there was no significant difference between the depression scores ($P > 0.38$) and role realization scores ($P > 0.40$) of the subjects in the two groups; however, after the intervention, both scores showed significant differences ($P < 0.05$).

Implications for Practice: The intervention based on the self-management empowerment model led to significant improvement in depression and maternal role realization of the primiparae with hospitalized infant. This model can serve as a directive in neonatal wards and neonatal intensive care units.

Keywords: Depression, Empowerment, Grandmother, Mercer, Primipara, Role realization

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Introduction

Psychological pressure of pregnancy and labor puts mothers under severe stress and may undermine the process of maternal role attainment (1). Postpartum is a transition period during which the mother must adapt to all the new roles, patterns, and relationships emerging after childbirth (2). During this time, the mother is probably more vulnerable and stressed than any other previous stage of her life (3). Mercer has extensively researched the primiparae (4) and the process of maternal role attainment during the first year of motherhood (5, 6). Conceptually, Mercer's theory is focused on the mother-infant relationship and its effect on the mother's competence, confidence, and joy of motherhood (7). Mercer believes that even stressful issues originating from outside family can undermine the attainment of maternal role but underscores the positive role of nursing in this process (8). Furthermore, seeing the infant under distress and undergoing painful procedures can create a sense of fear and incompetence in the mother and delay attainment of maternal role (9).

Experiencing high levels of stress and anxiety can progressively increase the likelihood of developing clinical postpartum depression and anxiety (10). In a qualitative study, Nystrom et al. (2009) found that hospitalization and separation of a neonate from its mother in the first few weeks after labor cause substantial psychological stress in the mother, even when neonatal health is under no significant threat (11). The results of a study by Heidari et al. (2011) in Isfahan (Iran) on the parents of newborns admitted to neonatal intensive care units (NICUs) showed that they experience severe stress, sense of guilt, and fear of the baby's future and found that these negative feelings can be alleviated by the medical staff through informing the parents about the situation (12).

The prevalence of postpartum depression among Iranian mothers is generally high (about 28.7%) (13). The sudden psychosocial change due to experience of childbirth and motherhood is a potential risk factor for depression and is, in fact, a non-specific trigger for a variety of possible causes of this disorder (14). The most common risk factors associated with this disorder include young maternal age, unwanted pregnancy, low social support, neonatal problems, and crises of the year before childbirth (15). Depressed mothers feel less responsible and accountable for their baby and develop complex problems with regard to interaction with their child (16).

In addition, the ability of a woman to adapt to her role as a mother largely depends on her relationship with her spouse, mother, and other relatives. To successfully fulfill her role, a mother often turns to her family, relatives, especially her own mother, for help, but sometimes lack of awareness or insufficient capability make these family supports largely ineffective (17). Quoting the Mercer (1985), Tarkka (2003) stated that the most important source of support for maternal role is the woman's mother and then other women, such as her aunts, sisters, and friends (18). When an infant becomes hospitalized, the mother is in dire need of support, especially from her spouse, but during this period, the spouse is also likely to experience considerable distress and anxiety and may be under equally powerful physical and psychological stress (19); for example, it was reported that hospitalization of the first child can induce a powerful sense of shock and disbelief in fathers (20). In such a situation, one family member who can support the depressed parents most effectively and provide the much needed emotional and mental comfort is the baby's maternal grandmother, a woman who has experienced childbirth and parenting and has a strong relationship with the young parents (21) and can help them get through this challenging period by providing sympathy and compassion, as well as advice and instruction (22).

Once the baby is discharged from hospital, usually the spouse has to return to work, and in the absence of other supports, the mother may develop further mood problems. This issue highlights the importance of grandmother's supportive role (23). When adequately capable and empowered, grandmothers can assist the mother to face the emerging challenges of motherhood. Naturally, effective education is one of the most important means of such empowerment (24). The aim of empowerment is to improve self-management and capabilities (25). Although the literature contains several different empowerment models with different principles and procedures, the strategy and final goal of all these interventions is to empower the target group or person. One of these models is the self-management empowerment proposed by Ravanipour et al. (2008), which is the result of a grounded theory research on the concept of power in the elderly. This model consists of several concepts including change awareness, independence, role functioning, adaptability, perceived satisfaction, sense of control, and self-management ability (26), and given the relevance of these concepts to our objectives, this study was conducted based on this model.

In addition, Mercer's theory and model of maternal role attainment are both convenient and effective for reviewing, planning, implementing, and evaluating nursing care. Mercer believes that, due to a

multitude of variables involved, maternal role attainment is a very complex process and must be divided into four stages of anticipatory, formal (assuming the role), informal (fitting the role into lifestyle), and personal (internalizing the role). The first stage starts from pregnancy and the last stage ends three to four months after delivery. In this study, we are interested in the two middle stages of Mercer's theory (from delivery up to the first postpartum month) when coincided with illness and hospitalizations of infant (27). Thus, based on the concepts of self-management empowerment model and assuming that they can be extended for empowerment of a primipara with hospitalized infant via her mother (the baby's maternal grandmother), one can argue that awareness about the ongoing changes can trigger a process of empowerment in the primipara toward her independence, role functioning, and adaptability. On this basis, this study aimed to determine the effect of empowerment of grandmothers on depression and role realization of primiparae with hospitalized infant.

Methods

This randomized, controlled, clinical trial was conducted in 2014 to investigate the effect of empowerment of grandmothers on depression and role realization of primiparae with hospitalized infant. The study population comprised of grandmothers of first-born infants who were admitted to Shahid Rajaei Hospital of Gachsaran, (an affiliate of Yasuj University of Medical Sciences), Iran, for any reason.

The inclusion criteria for the mothers were primiparity, minimum age of 18 and maximum of 40 years, sonographically confirmed healthy fetus, no recorded history of depression, absence of abnormalities in the infant, consent, literacy, and the presence of biological mother of primipara and her consent to participate in the study. The exclusion criteria consisted of withdrawal at any stage of the study and death of the infant within a month after hospitalization. The inclusion criteria for the grandmothers were absence of any particular physical disability, educability, and willingness to educate her daughter.

Based on the study of Toosi et al. entitled "effect of attachment training on anxiety and attachment behaviors of primiparae" (28), considering $\alpha=0.05$ and $\beta=0.2$, and reviewing the mean and standard deviation of anxiety scores in the mentioned study (44 ± 4.2 and 47 ± 4.9 in the intervention and control groups, respectively), sample size was calculated by the formula of difference between two means. Using this formula, sample size was calculated to be 39 people per group. However, predicting 10% loss in sample size, each group was formed with 43 people; thus, a total of 86 people were included.

Due to physical proximity of the primiparae in the maternal ward, to prevent exchange of information between the intervention and control groups, the subjects were assigned to these groups through randomized convenience sampling with random allocation and the help of excel software. At the sampling stage, after creating a shortlist of eligible mothers (regarding the inclusion criteria), one of every two eligible individuals was removed from the study.

To ensure the accuracy of the results and prevent any exchange of information between the two groups, sampling of the intervention group was started only after sampling of the control group was completed. The entire sampling process was performed during four months (from May to August 2014). Data was collected by Beck Depression Inventory and a researcher-made questionnaire aimed to measure maternal role realization. Beck Depression Inventory is a self-report inventory comprising of 21 items concerning different symptoms. Subjects had to respond to the questions using a four-point Likert scale (ranging from zero to three). The questions covered areas such as sadness, pessimism, sense of failure and helplessness, sense of guilt, sleep disturbance, loss of appetite, and self-loathing among others. Using the Beck Inventory, the level of depression was evaluated by a score ranging from zero (no sign of depression) to 63 (severe depression). Validity of this inventory was confirmed by the study of Kordi et al. (29) on women aged 18 to 35 years, and the study of Dobson and Mohammadkhani (30) on Tehran citizens, and its reliability was confirmed with a Cronbach's alpha of 0.827.

The researcher-made role realization questionnaire was devised according to Mercer's theory (7) and Ravanipour's empowerment model (26) to examine how a mother with hospitalized infant assumes the role of motherhood. The questions were designed based on the effect of external support on assuming this role and the concepts of maternal role attainment right after labor and in the first postpartum month. Mercer's theory divides maternal role attainment into four stages as follows.

Anticipatory stage: acceptance of the fetus by the mother and psychological adaptation to pregnancy. During this stage, which coincides with pregnancy, the woman prepares herself for the role of motherhood and gathers the necessary information about her future roles and duties from various sources, especially from people with this experience.

Formal stage: during this stage, which starts with childbirth, the mother starts to assume the maternal role and learn the necessary actions in this regard.

Informal stage: the mother learns how to take care of her child more easily and improve her maternal role. This stage begins during the first postpartum month.

Personal stage: in this stage, which begins about four months after childbirth, the woman internalizes her maternal role and starts to accept herself as a competent and confident mother (7).

Our role realization questionnaire was generally based on stages 2 and 3 of Mercer's theory and principles of Ravanipour's empowerment model, which is based on the concept of power in the elderly and comprises of several criteria including change awareness, independence, role functioning, adaptability, perceived satisfaction, sense of control, and self-management ability. This questionnaire consisted of 34 items rated using a five-point Likert scale (ranging from "none" to "very high" corresponding to scores 1 to 5). Thus, the total score ranged from 34 to 170. Validity of this questionnaire was established by consulting 10 relevant instructors of universities of medical sciences. Ultimately, content validity of the questionnaire was confirmed with $CVR=0.75$ and $CVI=0.96$. Internal reliability of the questionnaire was verified with Cronbach's alpha coefficient of 0.91 and its external reliability was checked by test-retest method, giving a Pearson correlation coefficient of 0.95. In view of these results, the devised role realization questionnaire was found to be sufficiently reliable.

Due to hormonal changes during the first postpartum month and natural reduction of anxiety and depression after this time, all the subjects were examined within this period to eliminate the impact of this factor on the results of the intervention.

As mentioned, to devise the empowerment intervention, this study combined the principles of Mercer's theory with the concept of power in the elderly serving as the empowerment context as suggested in Ravanipour's self-management empowerment model. The empowerment intervention was implemented for mothers of primiparae with neonates admitted to NICUs, and they were asked to apply the learned empowerment methods to their primiparous daughters. Results of the empowerment intervention were gathered by asking the primiparae to complete both questionnaires. For the intervention group, one-hour meetings were held separately for each grandmother to inform her about the intervention procedure, objectives, stages, essential concepts, and empowerment practices that were to be applied to her primiparous daughter (primipara with hospitalized newborn).

During this period, the control group received no intervention other than the routine care. To collect the data, first the questionnaires were filled out by all the primiparae. To ensure the relatively uniform implementation of the intervention procedure for the intervention group, the intervention was implemented by holding two 2-hour sessions planned based on the education algorithm designed in five successive steps according to Ravanipour's empowerment model. The contents of the designed algorithm were previously reviewed and approved by two university instructors with expertise on the subject, advising and supervising professors, and the university's research Ethics Committee, and as stated, allowed the intervention to be implemented consistently and properly for all the participants assigned to the intervention group.

The intervention procedure consisted of the following steps:

Step 1: the grandmother's information about her daughter's emotional needs and the mother's awareness and expectations about her maternal role were evaluated by the researcher through personal interviews with both individuals. For example, too much or too low anticipations in the mother with regard to her maternal role were identified and recorded as a problem, and the anticipatory issues found to be due to lack of accurate and complete information about the physical and emotional changes during postpartum were flagged as change awareness deficit, so that they could be remedied in the next step accordingly through educational and psychological support. Thus, empowerment was provided via the grandmother.

Step 2: educational objectives were set based on the grandmother's response and awareness. For the above example, objective was set to improve the grandmother's awareness about postpartum by providing thorough information in this regard. For each patient, the set objectives were recorded in an individual file, which was later used to plan the rest of the intervention.

Step 3: based on the objectives set according to the patient, an appropriate program was planned (with the aid of the subject) by combining the concepts of the two middle stages of Mercer's theory with the concepts of power in the elderly as organized in the stages of self-management empowerment model (26 and 31). For example, whenever a grandmother was confused about the objectives, the researcher planned a program to help her manage this condition.

Step 4: modifications were made in different aspects, for instance, in how a mother can temporarily adjust her anticipations to maternal role or can be encouraged to seek and accept support from family members and organizations that may support the baby (when the baby is eligible for or entitled to such support), and other modifications concerning the family. Using reliable sources, the researchers also compiled an educational pamphlet containing information on various aspects of postpartum care in line with the steps of the model. This pamphlet was provided to all the mothers in the intervention group so that learning can be continued at home. Duration of the empowerment intervention was one month. The researchers and participants exchanged contact information to arrange meeting or phone conversation in case of any question.

Step 5: evaluation was made by phone calls or in meetings held during the intervening period depending on the subject's condition. During the one-month period of the intervention, the researcher made regular (weekly) phone calls to the participants to verify the correct course of the procedure. Once the intervention was complete, both groups refilled the questionnaires. The results of the two series of questionnaires in the two groups were compared to determine the effect of grandmother's emotional empowerment on her primiparous daughter with hospitalized baby. Of the 86 primiparae who entered this study, one (in the control group) was eliminated because of neonatal death, and one (in the intervention group) withdrew from the study. Thus, the study was completed with 84 subjects. In compliance with ethics principles, the project was first reviewed and approved by the relevant department in Bushehr University of Medical Sciences (BPUMS), which issued the needed permits and was kept informed about the progress of the study. In the course of sampling, research objectives, voluntary nature of participation, and confidentiality of any disclosed information were explained to all the participants, and they were asked to fill out the informed consent forms before participation. To simplify the processing and analyzing of the information provided via the questionnaires, the data was imported into computer and analyzed using descriptive statistics (frequency, mean and standard deviation) in SPSS (version 18). First, normality of the obtained data was verified by the Kolmogorov-Smirnov test. In view of research objectives, independent t-test was employed to compare the means of the quantitative variables in the two groups, and Chi-square test was used to compare the values of qualitative variables between the two groups.

Results

The Kolmogorov-Smirnov test showed that data of both questionnaires have a normal distribution ($P>0.5$). Subjects of the two groups showed no significant differences in terms of demographic characteristics ($P>0.05$). The mean ages of the intervention and control groups were respectively 27.02 ± 5.3 and 24.09 ± 4.1 years, between which t-test found no significant difference ($P>0.51$). Thirty-four women (80.9%) in the intervention group and 32 women (76.2%) in the control group had a high school diploma or higher education. Thirty-five women (83.3%) in the intervention group and 33 women (76.6%) in the control group were homemakers and the rest had other occupations. Table 1

Table 1. Comparison of demographic characteristics of the intervention and control groups

Demographic characteristics	Intervention group (mean \pm SD)	Control group (mean \pm SD)	Test result P-value
Age	27.02 \pm 5.3	24.9 \pm 4.1	0.51*
Frequency (percentage)			
Education level	Less than high school diploma	8(19%)	14(33.3%)
	High school diploma	14(33.3%)	14(33.3%)
	Bachelor's degree and higher	20(47.6%)	18(42.9%)
Occupation of the spouse	Employee	13(31%)	11(26.2%)
	Self-employed	25(59.5%)	23(54.8%)
	Unemployed	4(9.5%)	8(19%)
Occupation of the mother	Not a homemaker	7(16.7%)	9(21.4%)
	Homemaker	35(83.3%)	33(76.6%)

*Independent-Sample T Test

**Chi-square test

Table 2. Comparison of mean depression and role realization scores, before and after the intervention between the intervention and control groups

		Group		Test result inter-group
		Intervention	Control	
Depression score (Mean±SD)	Before the intervention	10.9±8.9	9.4±6.7	0.38*
	After the intervention	6.02±4.2	15.5±10.3	P<0.001
	Test result (Intra-group)	P<0.001**	P<0.001**	P<0.001
Role realization (Mean±SD)	Before the intervention	141.0±12.8	143.3±12.2	0.4*
	After the intervention	150.8±7.1	139.5±11.4	P<0.001
	Test result (intra-group)	P<0.001**	0.52**	P<0.001

*Independent-samples t-test

**Paired t-test

shows the demographic information of the participants in both intervention and control groups. The mean depression scores in the intervention and control groups were respectively 10.9±8.9 and 9.4±6.7 before the intervention, which reached to 6.02±4.2 and 15.5±10.3 after the intervention. Independent t-test showed that the difference between depression scores of the two groups before the intervention was not statistically significant ($P>0.38$), but became significant after the intervention ($P<0.001$). Further details are provided in Table 2.

Table 2 also compares the mean role realization scores of the intervention and control groups before and after the intervention. The mean role realization scores in the intervention and control groups were respectively 141.02±12.8 and 143.3±12.2 before the intervention, which reached to 150.8±7.1 and 139.5±11.4 after the intervention. As before, independent t-test showed that the difference between the role realization scores of the two groups was not statistically significant before the intervention ($P>0.4$) but became statistically significant after the intervention ($P<0.001$).

Discussion

This study aimed to investigate the effect of empowerment of grandmothers on depression and role attainment of primiparae with hospitalized infant. According to our results, empowerment of grandmothers significantly reduced depression scores and improved role realization scores of primiparae with hospitalized infant, leading to a statistically significant difference between the final results of the intervention and control groups. Although we found no previous study on the effect of empowerment of grandmothers on depression and role realization scores of primiparae with hospitalized infant, the literature contains several studies on the effect of empowerment on different aspects of patients' lives.

The studies of Musters (32) and Hung (33) in England, Khoramirad et al. (13) in Qom, Iran, and Akbarzade et al. (34) in Mashhad, Iran, showed that incorporation of support programs into routine postpartum care is extremely effective in reducing postpartum depression. The same result was observed in our study.

The study of Nakku et al. (15) reported a severe risk of postpartum depression during the first six weeks after labor and that additional support, guidance, and counseling could prove effective against this risk. Our investigation demonstrated that active support of primiparae by empowering baby's maternal grandmother is effective in reducing the risk of postpartum depression. In our results, empowerment of grandmothers significantly reduced the mothers' depression scores, and the effect was clearly reflected in the small rate of depression in the intervention group in contrast to the high rate of depression in the control group. In a study by Ismaili and Hussaini (35) on the prevention and treatment of postpartum depression, the results showed the positive impact of social and family support received by primiparae on the rate of postpartum depression, which is consistent with our results.

Comparison of the role realization scores of the primiparae with hospitalized infant before and after empowerment of grandmothers indicated a significant difference between the results of the intervention and control groups, showing that this empowerment improved role attainment in these primiparae.

Mercer (2005, 1986) is one of the few who have researched the effect of family and social support provided by experienced people, like grandmothers, on the acceptance and attainment of maternal

role (4, 7). In her studies, she continuously emphasized on the factors that may influence maternal role attainment and its stages, including the abnormal condition of mother or infant, such as illness or fragility of the baby. The majority of Mercer's works were on primiparae and the process of becoming a mother. In our study, we employed the Mercer's theory on the stages of maternal role attainment to devise a role realization questionnaire and used it to measure this factor in a group of primiparae before and after our intervention.

Confidence and self-reliance have major impact on attainment and realization of maternal role. Hessa et al. (36) studied this effect and the influence of self-confidence on parenting role in parents of high-risk infants and reported that parents, especially mothers, who have high self-reliance and self-confidence are more successful in assuming their parental role. There also have been some studies on the effect of essential education to primiparae to promote their self-confidence and role attainment. For example, Jafarnejad et al. (37) investigated the impact of education by educational pamphlets on neonatal care and reported that mothers receiving essential neonatal care education in person and by pamphlets showed significantly greater self-confidence. Soon et al. (38) studied the effect of confidence-boosting programs for mothers and reported the positive effect of education and support factors on mothers' ability to take care of their babies. As is evident, the results of above studies are all consistent with our results.

In a study by Mercer (6), which was focused on the process of becoming a mother and the factors affecting maternal role attainment, she stated that the most important factors in this regard are self-confidence and having a sense of competence for the role of motherhood, having previous experience of childbirth and infant care, feeling a sense of joy in motherhood, attachment to the child, social and family support, and infant health. These factors were also considered in this study.

In this study, the self-management empowerment model and Mercer's theory were utilized to support the primiparae with hospitalized infant by educating and empowering their mothers (the baby's grandmother), and thereby, improve their contribution to maternal role attainment and realization in their daughters. The results presented within this paper suggest the positive effect of such empowerment in realization of maternal role in primiparae. A primipara with improved maternal role and better performance in handling the infant gains a sense of comfort followed by a feeling of competence, which further enhances her performance and forms a cycle of improvement. In fact, mothers who feel confident in taking care of their children can better handle the related tasks and address the multiplicity of their roles with greater competence (39). In the study of Chuan-Tan et al. (2013) on the effect of educational pamphlets on caregivers of Singaporean children with asthma, it was reported that disease management via education could significantly reduce the medication needs of these children (40).

The present study also faced a number of difficulties and limitations. One particular difficulty was to access the subjects who met the inclusion criteria. In addition, since this study was focused on the first postpartum month, the role of hormones on the mothers' postpartum mood could be substantial, therefore, a study with the same design but a longer follow up period is recommended.

Implications for Practice

Given that the model used in this study was based on the needs of primiparae and the sensitivity of the infant hospitalization causes a generally close relationship between nurses of neonatal wards and parents of medically fragile infants, this model can be modified to improve nursing care and practices in neonatal wards. Many of the primiparae and their families have insufficient information about the changes during pregnancy and postpartum and the care needed by postpartum women. Thus, providing adequate information and awareness to caregivers (in our case the maternal grandmothers) about the changes to be expected and how to take care of the mother in distressful situations caused by fragility of the infant is the first step in empowering the primiparae. The findings of this study could be a start for further assistance to families having their first child. All caregivers, especially hospital nurses, can play a substantial role in educating patients as well as their families in such situations. In view of our results, allocation of a small budget by healthcare authorities to effective educational programs could prevent serious direct and indirect damages of postpartum depression to new mothers and their families.

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Conflicts of Interest

The authors declare no conflict of interest.

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