

## Comparison of Effects of Home Visits and Routine Postpartum Care on the Healthy Behaviors of Iranian Low-Risk Mothers

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### ABSTRACT

**Background:** Postpartum care at home is a post delivery care method that can be provided by public health nurses, trained health workers, or midwifery nurses. A study conducted to compare effect of two midwife visits at home to usual postpartum care on the healthy behaviors of low-risk Iranian mothers.

**Methods:** A randomized controlled trial conducted on 200 mothers at a reference center for screening for infant hypothyroidism in Tehran. Mothers were randomized to either home-based ( $n = 100$ ) or routine-based postpartum care ( $n = 100$ ). Each mother and her neonate received two cares. Home-based cares were provided by a midwife in the intervention group. Postpartum cares in the control group were provided by care providers of primary health care system. Healthy behavior was measured using a validated and reliable researcher made instrument. The data were analyzed using independent sample  $t$ -tests, paired  $t$ -test, and  $\chi^2$ -test.

**Results:** The data showed that a significant number of subjects in the control group did not receive their postpartum care ( $P < 0.001$ ). The mean score of maternal healthy behaviors in the intervention group increased from 120.5 (SE = 0.76) to 148.9 (SE = 1.02) ( $P < 0.001$ ) and in the control group from 119.9 (SE = 1.06) to 140.9 (SE = 1.08) ( $P < 0.001$ ). The mean score of maternal healthy behaviors in the intervention group had significant differences with that in the control group at the end of study ( $P < 0.001$ ).

**Conclusion:** Early postpartum care at home by trained midwives can be positively effective for improving maternal healthy behaviors in less developed countries.

**Keywords:** Care, home visit, Iran, maternal healthy behavior, midwifery nurses, postpartum

### INTRODUCTION

Postpartum time is a critical physiological adaptation phase and therefore has a meaningful impact on the future maternal and neonatal health.<sup>[1,2]</sup> Its importance is also due to the risk level of mortality and morbidity in this period. In recent years, about

40% of the under 5 year deaths have occurred in the neonatal period in the world.<sup>[2]</sup> Estimates show that over four million neonatal deaths occur annually within the first 4 weeks after birth in the world and about 3 million cases in the early neonatal period.<sup>[2]</sup> On the other hand, approximately 50 million women are annually affected by postpartum maternal morbidity in the world.<sup>[3]</sup> In this period, the mother is faced with many physical and emotional challenges.<sup>[4,5]</sup> She also should learn about the infant-care behaviors in addition to her health problems. Hence, the mother needs more social, educational, and medical support.<sup>[6]</sup>

Studies have shown that a considerable rate of maternal morbidity and mortality is inevitable by standard postpartum care.<sup>[7]</sup> Although some efficient postpartum care packages have been identified and confirmed to reduce neonatal mortality and morbidity,<sup>[8-13]</sup> postpartum health care is a neglected issue.<sup>[14]</sup> This inadequacy occurs during the routine postpartum care where the mother's demands do not meet the provided care<sup>[14]</sup> and leads to chronic and long-term health problems.<sup>[15,16]</sup>

From the past, providing appropriate care based on sociocultural beliefs and economic status of the mother is considered a goal for standard care.<sup>[17]</sup> It is due to deep influence of many factors including the performance of service providers, enjoying social support, and the rate of adaption to the mother conditions on the effectiveness of this care.<sup>[18-22]</sup>

Postpartum care at home is a post delivery care method that can be provided by public health nurses, trained health workers, or midwifery nurses.<sup>[20,23]</sup> This type of maternal and neonatal care includes mother and neonate health problems assessment and training for self and child care and also, under particular conditions, refers them to specialized maternal and neonatal service centers.<sup>[24,25]</sup>

Although the general efficacy of home visits as a type of postpartum care has been approved in various studies,<sup>[8-13,26,27]</sup> its effects are influenced by socioeconomic and cultural conditions of the mother and her family.<sup>[19]</sup> Therefore, assessing its effects in different settings would be reasonable.

Bashour *et al.*<sup>[3]</sup> from Syria have shown that postpartum home care improved the exclusive breastfeeding but has not any other positive effects on maternal or neonatal health status. Against their

results, Quinlivan and his colleagues concluded that postpartum home visiting do not have any improving effect on breastfeeding but positively affect the contraception usage and adverse neonatal events.<sup>[9]</sup>

Although postpartum care at home is universal in many western countries, but in less developed countries such as Iran, it is not known as a widespread and routine program.<sup>[26]</sup> In Iran, although postpartum care is usually provided in governmental and nongovernmental facilities, all these types of care are provided outside of the home. The high costs<sup>[26]</sup> or lack of controlled trial studies that provide some positive evidence on efficacy of this method in Iranian cultural and the socioeconomic conditions are two main obstructing factors for providing this type of care as a routine care. Therefore, as a part of evidence providing on postpartum home visiting in Iran, effects of postpartum care provided at home were compared with outside home routine cares on the low-risk Iranian mothers during 2010.

## METHODS

This study was a randomized controlled trial of 200 mothers who had recently given birth during September–December 2010. The Ethics Committee of Tehran University of Medical Sciences approved the study protocol. The sampling was conducted at a reference center for screening infant hypothyroidism in Tehran. The convenient sampling method was used in this study. On the basis of a pilot study and considering the assumptions of 90% of the statistical power, a two-sided  $\alpha$  error of 0.05% and 20% drop-out rate, the original sample size was estimated 100 persons in each group.

The inclusion criteria were limited to a woman who had a healthy and term newborn in her recent low-risk pregnancy, recourse to the sampling environment between 3 and 5 days after delivery, received the first postpartum care in health service centers by a general physician and a dentist, ability to discuss and understand the Persian language, and being a resident of any of 10, 11, or 17 zones of Tehran metropolitan and the first or second birth order for her infant. The exclusion criteria were consisting of known physical or mental disorder in each mother or neonate, divorce, and also mother or infant hospitalization for more than 72 h.

After initial sampling, study information and participation guidelines were explained to the mother and she was asked to complete and sign the informed consent form. Then using a table of random numbers, subjects were manually assigned to intervention and control groups. Baseline data were collected prior to random allocation.

Following the random allocation, each mother and her neonate were assigned four cares: Two for the mother and two for the newborn. The first maternal (second based on the national guideline) was within 10-15 days and the second (third based on the national guideline) within 42-60 days after delivery. Neonatal cares provided simultaneously with maternal care.

Postpartum care package was the same to both groups, according to the Iranian National Guideline of Maternal and Neonatal Postpartum Cares designed by Ministry of Health (revised Spring 2008) but for the intervention group, care was assigned at home whereas routine postpartum care for the control group was provided at health service centers. On the basis of our national guideline, postpartum care includes three cares at 3-5, 10-15, and 42-60 days after delivery. In this study, mothers and their neonates received the first postpartum care at health service centers in both groups. Second and third cares were provided by health care providers (who are mostly midwives) at a referral health service center for the control group and by a trained midwife for the intervention group.

Postpartum home visiting includes greeting and establishing an intimate relationship with the mother, identifying mother's socioeconomic status (SES) and lifestyle, assessing vital signs, consciousness, alcoholism, convulsion, breathing problems, abdominal or flank pain, any bleeding, suture complications, defecation problems, vertigo, inflammation of the gums, shock, symptoms of psychological disorders, comorbidities and medical history, consultations on family planning (FP), breastfeeding and medicinal supplements, examination of extremities, breasts, eyes, abdomen and urinary and reproductive organs, identifying wife and any social abuse and as a main component providing health education based on her SES and health status.

The data collection instrument was consisted of two structured semi-self-reported questionnaires.

First of them was designed for assessment of background and demographic data and second for evaluation of maternal healthy behaviors. Questionnaires were reviewed and approved by a team of 10 members of the midwifery department in Tehran University of Medical Sciences for face and content validity. The reliability of the maternal healthy behavior questionnaire was assessed by estimating the correlation coefficient of test-retest with 15 days interval and also Cronbach's  $\alpha$ . The correlation coefficient of the first and second responses and overall  $\alpha$  were estimated to be 75% and 72%. This instrument was included 64 questions and 9 categories.

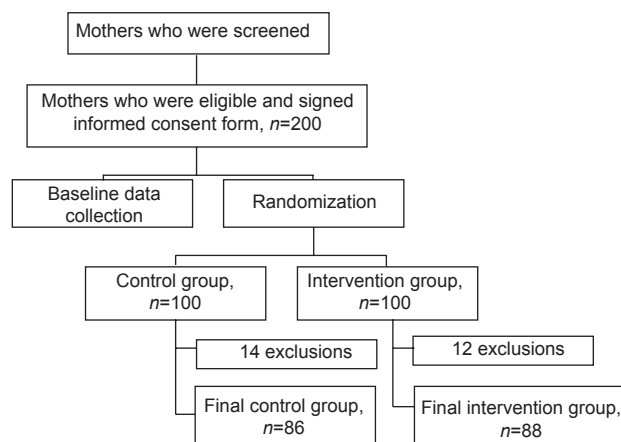
The outcome was assessed at 2 months after the start of the study. Our desired outcome was maternal healthy behaviors. Healthy behaviors included maternal behaviors in relation to nutrition, physical activity, cigarette smoking and alcohol consumption, breastfeeding, FP, personal and mental health, and ability to taking care of the newborn. An outcome measure was constructed by awarding one point to each true answer and then summing up the participant points.

The data were analyzed using univariate statistical tests such as independent sample *t*-tests, paired *t*-tests, and  $\chi^2$  tests (SPSS version 11.5).

## RESULTS

Although 200 mothers were enrolled and randomized, at the time of analysis 88 of them remained in the intervention group and 86 in the control group (The study profile is presented in Figure 1). In the control group, two participants were excluded because their newborns were hospitalized for over 72 h, five people had to be referred to other health centers outside the study coverage, three patients refused to continue the study, and four cases for other reasons. In the intervention group, four people were excluded because of hospitalization of their newborn for over 72 h, one due to emigration and seven others for refusal.

The mean age and the standard error, respectively, were 27.18 and 0.47 in the intervention group and 3.28 and 0.51 in the control group. Comparison of the means of maternal age showed no significant statistical difference in the two groups ( $P = 0.104$ ).



**Figure 1:** Full trial profile

Table 1 shows the data of the background and demographic characteristics of mothers between each study groups. The last right-hand column presents the *P* values for the corresponding variables.

Results showed the mean score of maternal healthy behaviors in the intervention group increased from 120.5 (SE = 0.76) to 148.9 (SE = 1.02) and in the control group from 119.9 (SE = 1.06) to 140.9 (SE = 1.08). The findings of the independent two-sample *t*-tests showed significant differences between the intervention and control groups before and after the study. Also for both groups, comparison of the mean scores of the healthy behavior before and after the intervention indicates significant differences between the two times. Table 2 shows the mean score of maternal healthy behaviors in each subcategory as well as the status of each group related to care provision.

## DISCUSSION

This study showed that postpartum home-visiting by trained midwives can improve maternal healthy behaviors. Yet, the study results suggest that healthy behaviors in both groups compared with their previous differences were statistically significant. This finding is in accordance with our earlier sentence which effectiveness of home-visits after delivery was approved by many studies.<sup>[12,28]</sup> However, one study ruled out improving the effectiveness of this type of care in low-risk mothers.<sup>[26]</sup> Two probable reasons to justifying this disagreement are the effects of home visiting postpartum care could

be dependent on the local, cultural, and the socioeconomic conditions and also differences between hospital-based postpartum care (the control group in the study of Escobar *et al.*) and health service center care provided for the control group in our study. Further, several studies showed that the effect of home visits depended on several factors and believed that some of the subgroups of new mothers needed special postpartum care.<sup>[3,9,19]</sup>

Statistical comparisons of baseline characteristics showed that the groups were comparable at the baseline with the exception of the first neonatal care, which had no significant differences. This strength can improve the internal validity of the study.

Significant differences of healthy behaviors between intervention and control groups can be interpreted as a kind of difference in receiving care, because a considerable proportion of the control group do not receive at least one of the two planned care periods. The results of the study along with a lack of care by a large number of participants in the control group can provide reasons on the superiority of active postpartum care. Gogia *et al.*<sup>[23]</sup> conducted a systematic review and concluded that the active care provided at home by community health workers would be useful in the developing countries. Therefore, our finding can be due to postpartum home-visit is a type of active care.

Although, based on our findings, home-visits are better than routine care to improve healthy behaviors, active efforts to provide routine care may have adequate benefits. Sword *et al.*<sup>[20]</sup> emphasized that home-visits are more effective care than telephone follow-up care. On the other hand, studies which show that apart from the effects of care on some of the outcome, satisfaction of care was better in home-visiting<sup>[3,26]</sup> which clarifies that precise studies of this issue are necessary to identify cost-effective methods for postpartum care. Recommendation of routine home-visits after delivery is doubtful in developing countries because of the costs,<sup>[26]</sup> dependency of its effectiveness on various factors, and lack of evidence.

In this study, maternal care was provided twice at home and on the other hand, the outcome measurement was conducted almost immediately after the second care. Considering this and the significant results in both groups after the study

**Table 1:** Background and demographic characteristics of participants of the three study groups

Characteristics	Intervention group (counts)	Control group (counts)	P value
Age			0.329 without greater than 30
<20	1	2	
21 to 30	62	54	
>30	25	30	
Gravity			0.451
1	47	39	
2	32	40	
3 and more	9	7	
Birth order			0.665
1	54	50	
2	34	36	
Number of abortions			0.76 without 2 and more
0	72	68	
1	15	16	
2 and more	1	2	
Method of delivery			0.28 without AVD
Spontaneous vaginal delivery	26	20	
Assisted vaginal delivery	3	0	
Cesarean section	59	66	
Sex of baby			0.542
Male	43	46	
Female	45	40	
Education			0.56
High school or less	65	60	
College or more	23	26	
Household income			0.061
Less than \$300	13	11	
300 to \$600	56	67	
More than \$600	19	8	
Woman's working status			0.61
Housewife	81	77	
Employed	7	9	
House ownership			0.62
Owns a house	30	22	
Shares a house	8	11	
Rental house	49	53	
Life satisfaction status			0.719
Satisfied	62	56	
Almost satisfied	24	27	
Not satisfied	2	3	
First maternal care (3-5 days after delivery)			0.558
Yes	74	75	
No	14	11	
First neonatal care (3-5 days after delivery)			0.258
Yes	18	12	
No	70	74	

follow-up, we can conclude that even one timely postpartum care at home or outside can improve

the mother's ability to deal with the maternal and neonatal challenges. Bashour *et al.*<sup>[3]</sup> and

**Table 2:** Mean score of maternal healthy behaviors in each subcategory and status of each group related to care receiving

Care status	Intervention group (count)	Control group (count)	P value*
Second maternal care (in 10-15 days after delivery)			<0.001
Received	88	25	
Not received	0	61	
Third maternal care (in 42-60 days after delivery)			0.015
Received	87	78	
Not received	1	8	
Second neonatal care (in 14-15 days after delivery)			<0.001
Received	88	51	
Not received	0	35	
Third neonatal care (in 30-45 days after delivery)			<0.001
Received	88	70	
Not received	0	16	
Sub outcomes	Mean (SD)	Mean (SD)	P value**
Nutritional behaviors			
At start time	53 (4.7)	53 (6.4)	0.979
At end time	61 (6.4)	59 (6.6)	0.068
P value, paired <i>t</i> -test	<0.001	<0.001	
Physical activity behaviors			
At start time	3.8 (1.9)	3.9 (1.9)	0.755
At end time	4.9 (1.7)	4.3 (1.9)	0.049
P value, paired <i>t</i> -test	<0.001	<0.001	
Smoking and alcohol consumption behaviors			
At start time	8.5 (0.5)	8.6 (0.5)	0.64
At end time	8.8 (0.38)	8.7 (0.48)	0.019
P value, paired <i>t</i> -test	<0.001	0.002	
Sunbathing behaviors			
At start time	2.4 (1.6)	2.4 (1.6)	0.956
At end time	3.4 (1.5)	3.2 (1.9)	0.609
P value, paired <i>t</i> -test	<0.001	<0.001	
Personal health behaviors			
At start time	22.9 (1.98)	22.8 (2.2)	0.679
At end time	26 (2.4)	24.6 (1.84)	<0.001
P value, paired <i>t</i> test	<0.001	<0.001	
Mental health behaviors			
At start time	1.7 (0.6)	1.6 (0.57)	0.64
At end time	1.9 (0.58)	1.7 (0.6)	0.007
P value, paired <i>t</i> -test	0.003	0.109	
Breastfeeding behaviors			
At start time	19.5 (4.1)	18.9 (4.3)	0.37
At end time	23.6 (2.3)	21.1 (3)	<0.001
P value, paired <i>t</i> -test	<0.001	<0.001	
Ability to taking care of the newborn			
At start time	8.57 (1.2)	8.6 (1.3)	0.71
At end time	17.6 (1.7)	16.4 (2)	<0.001
P value, paired <i>t</i> -test	<0.001	<0.001	
Family planning behaviors			
At end time	1.59 (0.77)	1.55 (0.79)	0.04
Healthy behavior			
At start time	120.5 (7.16)	119.9 (9.79)	0.648
At end time	148.9 (9.58)	140.9 (9.98)	<0.001
P value, paired <i>t</i> -test	<0.001	<0.001	

\*Statistical test was  $\chi^2$ -test, \*\*Statistical test was independent sample *t*-test

Baqui *et al.*<sup>[21]</sup> also addressed this issue in separate studies. They recommended immediate and timely care after delivery. It may be because of effects of timely providing mother's demands with lowest time from delivery. Further works can be recommended to assessing effects of various numbers of postpartum cares and also those distances from delivery.

The findings of this study indicate that home care compared with routine care had no significant effects on healthy behaviors associated with nutritional behaviors, sunbathing, and somewhat physical activity. Considering the need of long education to affect nutritional and physical behaviors of mothers against cultural and local costumes we could justify this finding. However, more research is needed to be done in this area, especially in Iran.

The results of this study confirm those of other studies<sup>[9,11]</sup> in relation to the significant improvements in FP behaviors by postpartum home-visits. During the postpartum period, the mother strongly feel for need of FP because of her recent hardships of pregnancy and delivery, so she looking for family planning. During home-visits, knowledge on mother's SES helps care providers to recommend best FP methods. These points may be probable justifications for significant effect of home-based FP educations.

In this study, short-term maternal mental health was influenced positively by home care more than by routine care, while it seems to have no statistically significant difference from other types of postpartum care.<sup>[11]</sup>

Like some other studies<sup>[3,26]</sup> and unlike evidence,<sup>[9]</sup> this study confirms a positive effect of home care on short-term breastfeeding. First time and some other mothers know less on the correct method of breastfeeding, thus they need to learn about it but during postpartum care at health service centers although care providers explain the correct breastfeeding position for them there is a public setting and mothers cannot learn and practice for breastfeeding. Against that, during home visits breastfeeding training and breastfeeding education were provided at most private setting for mothers. Considering cultural and religious barriers of public setting to teaching and also learning of female issues may help us to interpret the positive effect of home visit postpartum cares on the breastfeeding.

In this study, due to the limitations on the sample size a multivariate analysis was impossible to conduct considering potential confounders. The effects of the intervention on other subgroups of mothers were not possible to estimate because of the restriction of sampling for low-risk mothers. Nobody was blind in the study. In this study, no effort was made to control the completeness of routine care in the nonintervention group and so a remarkable proportion of this group did not receive all of three postpartum cares. The last limitation could interpret as low complete postpartum care delivery in Iran and need of active postpartum cares.

## CONCLUSIONS

Early postpartum care at home by trained midwives is effective in improving maternal healthy behaviors such as breastfeeding and family planning. Due to the higher costs of home-visits and realistic assumption of the low rates of receiving routine care in developing countries such as Iran, the cost effectiveness assessments of other methods for postpartum care can enable health policymakers.

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