ORIGINAL RESEARCH

The effect of home care services on maternal health after cesarean delivery in Turkey

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Abstract

Background: Cesarean delivery is one of the most common surgical procedures performed today in Turkey. Maternal death after cesarean delivery is rare. However, more maternal problems arise after cesarean delivery compared to vaginal delivery. Therefore, it is very important for the nurses to make home visits to the women who can not properly benefit health services due to early postpartum discharge. The present research was conducted in order to determine the effect on maternal health of home care services given to the women who were discharged from hospital 96 hours after cesarean delivery.

Methods: This randomized control study consisted of 140 women (intervention group=70, control group=70) who resided in Middle Anatolia, Turkey. Three home visits were made on the 2nd, 15th and 42nd postpartum days after discharge of the women in the intervention group. Care and training was given to the women during these visits. There was no intervention for women in the control group.

Results: A statistically significant difference was found in favor of the intervention group in terms of health problems during the 6-week postpartum period.

Conclusions: The research indicated that nurses' planned home visits to women discharged early from hospital following birth by cesarean delivery affected mother's health positively.

Key words

Cesarean section, Early postpartum discharge, Home care, Maternal health

1 Introduction

1.1 Background

Today, length of medical follow-ups and care provided at the hospital after birth has been shortened with "early post partum discharge" approach. American Academy of Pediatrics (AAP) (1997) and American College of Obstetricians and Gynecologists (ACOG) (1997) described "early postpartum discharge" as discharging mother and baby 48 hours after vaginal delivery and 96 hours after cesarean delivery in case of absence of complications [1]. Mothers spend recovery time at their homes with early postpartum discharge. Thus, time during which patients may be exposed to hospital pathogens is

shortened and hospital expenses are decreased [2-4]. However, shortened postpartum hospital stay means that women cannot benefit during their hospital stay from enough service-nurses and other health services. Therefore, the risk of complications and morbidity for puerperal women can increase during postpartum period. One of the important factors that increase complication risk during post partum period is cesarean delivery.

Although mother mortality is rare in cesarean delivery, maternal complications develop more compared to the vaginal delivery after cesarean delivery [2, 3, 5]. It is known that the most frequently seen complications in women who give birth by cesarean delivery and are early discharged during postpartum period are postpartum infections mainly endometritis [5-7]. Other complications that may develop during post partum period are postpartum hemorrhage, incision complications, urinary tract infections, constipation, thromboembolism, mastitis, breast diseases like engorgement, breastfeeding problems, and pains associated with engorgement and cesarean delivery [8-10]. Thus, it is very important to make planned home visits after discharge for the women who are unable to benefit health services enough due to the early postpartum discharge so that postpartum complications can be detected at an earlier period, trainings and consultancy about women's and babies' care can be given and women themselves can perform care [5, 11, 12].

General Directorate of Basic Health Services (2006) reports that number of medical follow-ups per puerperal women in Turkey is 0.98 [13]; which indicates that puerperal follow-ups are insufficiently performed in our country and women are not visited at their homes during the postpartum period. Therefore, the fact that puerperal women are poorly followed-up at home in Turkey has been the main motive of the research. It was a randomized controlled study conducted in order to determine the effect of home care services given to the women who were early discharged from the hospital after cesarean delivery upon mother health.

1.2 Hypotheses

There may be statistical significant difference between intervention and control group aspect of uterus involution, lochia problems, incision problems, breasts problems, effective breastfeeding, emotional psychological problems, problems about the mother-baby relationship during the 6-week postpartum period.

2 Patients and methods

2.1 Methods

2.1.1 Design and sample

It was a quasi-experimental desing conducted in order to determine the effect of home care services given to the women who were early discharged from the hospital after cesarean delivery upon mother health. The population of the research was made up by the women who gave birth by cesarean delivery and were treated at the post-operative unit at Birth and Child Care Hospital between the 10th of June, 2008 and 10th of April, 2009. The number of the participants to be assigned to experimental group and control group was calculated through the formula of the ratio obtained from two independent groups or sample size estimation to determine the difference between two rates. This formula provided us with the suitable sample size which was necessary to study whether there was a difference between ratio and percentages obtained from the two independent groups (maternal problems) in terms of a qualitative variable (home care service). According to the formula, the sample of the research was consisted of 140 women who gave birth by cesarean delivery (70 women were assigned to intervention group and other 70 to control group). Women who spent a pregnancy period with complications, who developed complications during cesarean delivery, who developed complications after cesarean delivery or whose baby developed complications after cesarean delivery or those who had such chronic diseases as heart diseases, hypertension, diabetes, renal diseases were excluded from the research since we thought these would affect the results of the research. Only those who gave birth by cesarean delivery and accepted to participate in the research voluntarily were included in the research.While determining the groups, women were first grouped according to the characteristics (age,

educational status, health insurance, monthly total income amount, parity and prepartum care) that may be affecting the results of the research and intervention group and control group were made using simple random sampling method according to each characteristic. Through this method, 200 numbers were determined using random numbers table. Seventy women were assigned to intervention group and 70 women to control group out of 200 numbers where women's file numbers were registered by using simple random sampling.

2.1.2 Measures

Descriptive Data Collection Form about Mothers' Characteristics designed after a literature survey [8-10] and a consultation with an expert, Assessment Form of Early Postpartum Period, Problem Survey Form for the problems experienced at home during 6-week postpartum period were used in this research. Also, a booklet that included trainings and care plans for women was designed in order that home care services could be performed. The data collection forms, training-handbook and care plan were designed by the researcher after the literature had been reviewed and the expert opinion had been obtained. Before using these materials in the research, they were administered to 20 women who had delivery by caesarean section at Çorum Birth and Child Care Hospital and their comprehensibility and content validity were tested and were reviewed and finalized.

2.2 Analytic strategy

The data were collected at two phases: the first phase was conducted at the hospital after cesarean delivery and the second phase was conducted with 3 home visits after discharge. Home visits were made by the researcher intervention and control group on the 2nd postpartum day, 15th postpartum day and 42nd postpartum day. Appointments were made before each home visit both for women of intervention group and control group. Also, we phoned the women in order to fix the visit day and hour. Visits lasted approximately 1-1.5 hours for the intervention group and 30-45 minutes for the control group. The procedure below was followed for the data collection:

2.2.1 First phase (Hospital follow-up)

The researcher first met mothers of intervention group when they came in the post partum service of Birth and Child Care Hospital (before cesarean delivery) and gave information about the research and obtained their oral consents. The researcher first met mothers of control group after their cesarean delivery at the intensive care unit of post partum service and gave information about the research and obtained their oral consents. Following the oral consents, the researcher administered Descriptive Data Collection Form about Mothers' Characteristics, Assessment Form of Early Postpartum Period and appointments were made for home visits. Researcher made the second interview with the mothers of intervention group after cesarean delivery at post partum service. The researcher conducted medical examination and follow-ups of these women before discharge during this interview at the post partum service.

2.2.2 Second phase (Home follow-up)

The researcher performed the first follow-up of the mothers of both intervention group and control group within the 24 hours after discharge (on the second day after birth); the second follow-up on the 15th day after birth and the third follow-up on the 42nd day after birth according to the previously fixed appointment time. The researcher first gave training to the mothers of intervention group according to the training-booklet. Then, the researcher intervened in accordance with the Form of Nursing Care Plan of Mothers and determined the problems experienced by the mothers at home during postpartum period according to Problem Survey Form for the problems experienced at home during 6-week postpartum period. The researcher did not perform any nursing intervention at all for the mothers of control group during the visits. The researcher only administered the Problem Survey Form for the problems experienced at home during 6-week postpartum period in order to explore the problems experienced by mothers at home during postpartum period.

2.3 Analysis of the data

Independent variables of the research were nursing interventions (care, trainings, and consultancy) performed during the home visits and dependent variables of the research were postpartum maternal problems, going to the health centers and

self care agency. Data were analyzed using Statistical Package for the Social Sciences (SPSS) for Windows (version 13.0; SPSS Inc., Chicago, IL, USA), percentages, McNemar chi-square test and relative risk.

2.4 Ethical considerations

The research protocol was reviewed and approved by the Institutional Review Boards of the medical center and county board of education (09/269). The Principles set out by the Declaration of Helsinki and national and local ethical guidelines for research were also followed. For the pre-test of the research instruments and the administration of the research, the necessary permissions were obtained from the hospital.

3 Results

In total, 140 women were included. Of these women, 70 were intervention group and 70 control group. More than half of the women of intervention and control group belonged to 25-29 age group (Intervention Group: 57.1%, Control Group: 57.1%) and they had high school degree or above as educational status (Intervention Group: 57.1%, Control Group: 57.1%). Also, all of the women in both groups had care and trainings before birth (see Table 1).

Table 1. The distribution of according to demographic characteristics of women

	Groups			
	Intervention		Control	
	n	%	n	%
Age				
25-29 years	40	57.1	40	57.1
30-34 years	30	42.9	30	42.9
Education				
Elementary school	10	14.3	10	14.3
Upper Secondary school	20	28.6	20	28.6
University	40	57.1	40	57.1
Health Insurance				
Yes	70	100.0	70	100.0
No	0	0.0	0	0.0
Prenatal Care and Training				
Yes	70	100.0	70	100.0
No	0	0.0	0	0.0
Total	70	100.0	70	100.0

Note. Data are presented as number and percentage.

It was seen in the research that women of the control group had nearly 1.5 times as many problems as the intervention group during the 6-week postpartum period (relative risk [RR]: 0.73). This meant that 57.1% of the women of the intervention group and 78.6% of the women of the control group experienced at least one problem during this period. The difference between the groups was statistically found significant in favor of intervention group in terms of problem-experience during the 6-week postpartum period ($p = 0.007$) (see Table 2).

Table 2. The distribution of women according to problem-experience during 6 Week postpartum period

Experiencing problem during 6 week postpartum period	Groups				Chi-Square	*p*	Relative Risk (RR)
	Intervention (n=70)		Control (n=70)				
	n	%	n	%			
Experiencing	40	57.1	55	78.6	7.368	0.007	0.73
Not Experiencing	30	42.9	15	21.4			

When we analyzed the distribution of the participant women in terms of problems experienced during the 6 week postpartum period, it was seen that women of control group had nearly two times more abundant and dark lochia than the women of intervention group on the 2nd postpartum day (RR: 0.48). Similarly, women of control group had 1.5 times more pain- sensitivity-redness in the incision area than the women of intervention group on the 2nd postpartum day (RR: 0.84) and 15th postpartum day (RR: 0.73). Also, 14.3% of the control group and one woman of intervention group had yellowish and green discharge in the incision area on the 42nd postpartum day. When we analyzed the distribution of breast problems of the women of both groups, it was found out that women of control group had 2.3 times more engorgement, pain and sensitivity on the 2nd postpartum day (RR: 0.44) and 6.3 times more engorgement, pain and sensitivity on the 15th postpartum day than women of intervention group. Also, on the 42nd postpartum day, nearly half of the control group (42.9%) had engorgement, pain and sensitivity symptoms in breasts whereas only two women of intervention women suffered the same problems. Additionally, poor breastfeeding was seen among the women of both groups on the 2nd postpartum day at similar levels (Intervention Group: 25.7%, Control Group: 28.6 %). Also, it was found out according to the findings that women of control group had poorer breastfeeding compared to the women of intervention group on the 15th postpartum day (Intervention Group: 7.1%, Control Group: 42.9%) and on the 42nd postpartum day (Intervention Group: 2.9%, Control Group: 28.6%) (see Table 3).

When the groups were compared in terms of emotional psychological problems, it was found out that women of control group had two times more emotional psychological problems on the 2nd postpartum day and the 15th postpartum day than intervention group (RR: 0.48) whereas these women had 1.5 times more emotional psychological problems than women of intervention group on the 42nd day (RR: 0.67). Moreover, women of control group had 4 times more problems about mother-baby relationship on the 2nd postpartum day compared to women of intervention group (RR: 0.25) (see Table 3).

On the 2nd postpartum day, in terms of presence of abundant dark lochia, pain-sensitivity-redness in the incision area, engorgement-pain-sensitivity in breasts, emotional-psychological problems and problems about the mother-baby relationship; the difference between the two groups was statistically significant in favor of intervention group ($p<0.05$) whereas there was statistically insignificant difference between the groups in terms of uterus subinvolution, poor breastfeeding ($p>0.05$). On the 15th postpartum day, in terms of engorgement-pain-sensitivity in breasts, poor breastfeeding, psychological problem and problems about the mother-baby relationship; the difference between the two groups was statistically significant in favor of intervention group ($p<0.05$) whereas there was statistically insignificant difference between the groups in terms of pain-sensitivity-redness in the incision area problem ($p>0.05$). On the 42nd postpartum day, in terms of yellowish and green discharge with a bad odor in the incision area and engorgement-pain-sensitivity in breasts, poor breastfeeding; the difference between the two groups was statistically significant in favor of intervention group ($p<0.05$) whereas there was statistically insignificant difference between the groups in terms of pain-sensitivity-redness in the incision area and psychological problem ($p>0.05$) (see Table 3).

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Table 3. The distribution of the women according to the problems experienced at home on the 2nd, 15th and 42nd postpartum days (%)

Problems Experienced at Home	The 2nd Postpartum Day					The 15th Postpartum Day					The 42nd Postpartum Day				
	Groups		χ^2	*P*	RR	Groups		χ^2	*p*	RR	Groups		χ^2	*p*	RR
	Intervention (N=70)	Control (N=70)				Intervention (N=70)	Control (N=70)				Intervention (N=70)	Control (N=70)			
Uterus Subinvolution															
Yes	40.0	41.4	0.030	0.86	0.9										
No	60.0	58.6		3	7										
Abundant Dark Lochia															
Yes	21.4	44.3	8.289	0.003	0.48										
No	78.6	55.7													
Pain, Sensitivity, Redness in the Incision Area															
Yes	57.1	78.6	7.368	0.007	0.73	22.9	27.1	0.343	0.558	0.84	8.6	12.9	0.672	0.412	0.67
No	9	21.4				77.1	72.9				91.4	87.1			
Yellowish and Green Discharge with a Bad Odor in the Incision Area															
Yes												1.4	14.3	7.792[a]	0.04[a]
No												98.6	85.7		
Engorgement, pain, sensitivity in breasts															
Yes	11.4	25.7	4.723	0.029	0.44	7.1	42.9	28.810	0.00	0.16	2.9	42.9	31.759	0.00	a
No	88.6	74.3				92.9	57.1				97.1	57.1			
Poor Breastfeeding															
Yes	25.7	28.6	0.144	0.703	0.90	7.1	42.9	28.810	0.00	0.16	2.9	28.6	17.473[a]	0.00	a
No	74.3	71.4				92.9	75.1				97.1	71.4			
Emotional Psychological Problem															
Yes	21.4	44.3	8.289	0.003	0.48	21.4	44.3	8.289	0.003	0.48	8.6	12.9	0.672	0.412	0.67
No	78.6	55.7				78.6	45.7				91.4	87.1			
Problems about the Mother-Baby Relationship															
Yes	7.1	28.6	10.957	0.00	0.25	0.0	28.6	23.333[a]	0.000	a					
No	92.9	71.4				100.0	71.4								

a McNemar Chi-Square test was performed for the values <5.

It was found out in the research that none of the women of intervention group revisited a health center during the 6-week postpartum period whereas 14.3% of the women of control group revisited a health center on the 2nd postpartum day and three women on the 15th postpartum day due to the problems associated with breast and breastfeeding. When we analyzed the medical diagnosis of the women of control group; on the 2nd post partum day it was seen that 70% of the women who went to a health center had engorgement diagnosis and three women had mastitis diagnosis and on the 15th post partum day, three women who went to a health center had diagnosis of mastitis and one women had incision infection diagnosis. The difference between the two groups in terms of going to a health center on the 2nd postpartum day was statistically significant in favor of intervention group ($p = 0.001$) whereas the difference between the two groups in terms of going to a health center on the 15th postpartum day was statistically insignificant ($p = 0.079$) (see Table 4).

Table 4. Distribution of women according to revisiting a health center during 6 week postpartum period

Revisiting a Health Center	Groups				Chi-Square	*p*
	Intervention (n=70)		Control (n=70)			
	n	%	n	%		
The 2nd Postpartum Day						
Revisiting[a]	0	0.0	10	14.3	10.769[a]	0.001
Not Revisiting	70	100.0	60	85.7		
The 15th Postpartum Day						
Revisiting[a]	0	0.0	3	4.3	3.066[a]	0.079
Not Revisiting	70	100.0	67	95.7		

a McNemar Chi-Square test was performed for the values <5

4 Discussion

Women who are early discharged during postpartum period complain about hemorrhage, infection, thromboembolism, mastitis, breast problems such as engorgement and constipation as well as hemorrhoid, episiotomy, pain associated with engorgement or cesarean section, fatigue, psychological problems and poor support systems during postpartum period. Such complications as hemorrhage, puerperal fever, urinary system infections, breast problems and thromboembolism are seen more commonly in cesarean delivery compared to vaginal delivery [8, 9, 14]. Therefore, WHO (1998), AAP (1992, 1997) and ACOG (1992,1997) recommends planned home visits after postpartum early discharge for the early detection and treatment of problems experienced by mothers and babies [1, 15].

The research that compares standard postpartum care with home care after early discharge suggest that postpartum early discharge has numerous advantages for mothers and babies if home care of postpartum early discharge is regularly continued with home visits [5, 11, 12]. Similarly, it was found out in our research, too, that women of control group who did not obtain home care after postpartum early discharge had 1.5 times more problem during the 6 week postpartum period compared to the women of intervention group who obtained home care. It is very significant that the fact that women of intervention group who obtained home care after postpartum early discharge had fewer problems than women of control group during the 6 week postpartum period indicated that home care given after postpartum early discharge has positive effects on maternal health. Therefore, it was concluded in our research that planned home visits made by nurse during postpartum early period were a beneficial practice.

Cesarean delivery is one the most important risk factors of postpartum hemorrhage. The studies about postpartum hemorrhage reported that postpartum hemorrhage was seen more commonly among the women who gave birth by cesarean delivery compared to the women who gave birth by vaginal delivery and the rate ranged from 6% and 8% [8, 9, 16]. Postpartum hemorrhage is defined as blood loss of more than 500 mL or more following third stage of labor. Postpartum

hemorrhage may exceed 1000 mL following cesarean delivery [9]. The researches conducted reported that four of five women who had hysterectomy due to postpartum uterine atony gave birth by cesarean delivery. The use massive doses of halogen-containing anesthetic agents to relax uterus during cesarean operation and intrauterine manipulation may lead to uterine relaxation and uterine subinvolution during postpartum period [9, 16, 17]. On the 2nd postpartum day, uterine subinvolution and presence of abundant dark lochia was detected among the women of both intervention group and control group in our research. Therefore, it may be suggested that symptoms of uterine subinvolution and presence of abundant dark lochia on the 2nd postpartum day was consistent with literature [9, 16, 17]. However, the amount of lochia of the women of both groups was not as much as to be diagnosed as postpartum hemorrhage and problems associated with uterine subinvolution were solved after the 2nd postpartum day. It was found out after the analysis of findings that women of control group had more abundant and darker lochia compared to the women of intervention group on the 2nd postpartum day. It is known that problems associated with uterine involution during postpartum period may be prevented with fundus massage and follow-ups of lochia. Therefore, the fact that women of intervention group had fewer problems about lochia may be attributed to the care, trainings and consultancy given during home visits after discharge. Supporting our conclusion, the research of Koc (2005) indicated that women who were early discharged during postpartum period and received home care had fewer problems associated with lochia on the 15th postpartum day compared to the women who did not receive home care [12]. The same research reported that findings about uterine subinvolution (soft fundus, high fundus) were more common among the women of control group.

The most commonly seen problem after birth among the women who give birth by cesarean section is infection [3, 14, 18]. We did not detect any infection symptoms in the incision area among the women of both intervention group and control group on the 2nd and 15th postpartum day whereas on the 42nd postpartum day, we detected yellowish and green discharge with a bad odor in the incision area among the 14.3% of the control group and one women in the intervention group. Infection symptoms seen not during the early days after discharge but the following days after discharge made us doubt of poor care of incision area. The fact that women of intervention group who were treated at home after discharge and trained about postpartum care had fewer problems associated with incision area supported that conclusion. Such causes as poor care of incision area, uterine subinvolution, poor or excessive movements, continuously lying in the same position, poor and wrong breastfeeding increase the problems about incision area during the postpartum period. Therefore, it may be suggested that problems associated with incision area develop due to the preventable causes during postpartum period. Women of intervention group complained about pain-sensitivity-redness in the incision area less than women of control group during six week period. These findings were very significant in the sense that they indicated positive effects of home visits. It was explored in two researches conducted in our country too that women who received home care during postpartum period experienced less incision problems compared to those who did not get home care which was similar to the findings of our research.

After cesarean delivery, more problems associated with breasts and breastfeeding may be experienced compared to vaginal delivery because of such problems as delayed lactation and uncomfortable breastfeeding position. It was noted in many studies about postpartum early discharge that hospital stay did not affect breastfeeding process. Although educational status and socio economical status of these participant women were generally higher, they joined childbirth preparatory classes and/or obtained trainings before birth. Also the relevant studies conducted reported that home care services given after postpartum early discharge affected success of breastfeeding positively [19-21]. Despite being similar, our research pointed out that, women of control group had gradually more problems associated with breasts and breastfeeding after discharge whereas women of the intervention group had gradually fewer problems. However, there was no significant difference between intervention group and control group in terms of breastfeeding on the 2nd postpartum day which may be-we thought-resulting from the breastfeeding trainings given by the nurses after cesarean delivery at the hospital. Besides, it was concluded that problems associated with breast and breastfeeding increased gradually among the women of control group during postpartum period due to such reasons as incomplete trainings, women's avoidance to go to health centers for the problems associated with breast and breastfeeding and insufficiency of phone consultancy. On the contrary, the fact that problems associated with breast and breastfeeding reduced gradually among the women of

intervention group during postpartum period may be explained by the positive effects of breastfeeding trainings and consultancy given through home visits.

It was explored in our research that women of control group experienced emotional-psychological problems and problems about the mother-baby relationship more than the women of intervention group, which may be attributed to the fact that women of control group had more physiological problems and coped with pain, breastfeeding problems more. On the other hand, it was very important to note that the fact that women of intervention group were supported with home visits and experienced these problems less reflected the positive effects of home visits on postpartum psychological problems. The literature analysis demonstrated that postpartum early discharge did not affect maternal anxiety, depression and maternal role negatively [21-24]. Similar to our research, puerperal women in these researches were followed regularly by the nurses at their homes after postpartum early discharge. When we analyzed the researches conducted in Turkey, it was revealed in the study of Koc (2005) that women who obtained home care service after postpartum early discharge had less emotional-psychological problems than those who did not obtain home care problems [12]. It was found out in the research of Atici (2001) too that women who were early discharged during postpartum period and obtained home care service had lower anxiety scores compared to those who did not [11]. As for the study of Calisir (2003), it was seen that women who were helped by nurses about baby care had higher successful maternal role attainment scores [25]. These findings were similar to ours.

It was found out that none of the women of intervention group went to a health center during 6 week postpartum period. 14.3% of the women of control group went to a health center on the 2nd postpartum day and three women on the 15th postpartum day. According to the findings, women of control group went to a health center mainly due to breast and breastfeeding problems (engorgement, mastitis) and infection in incision area, which made us, conclude that women of control group lacked information about breast care, incision care and breastfeeding. However, it may be concluded that the reasons for which women of control group went to a health center might be prevented or solved at an earlier period by an effective nursing care and consultancy. This conclusion was, also, supported by the fact that none of the women of intervention group who obtained home care service after discharge went to a health center. Women of intervention group, too, had many problems during postpartum period yet their problems were fewer in number compared to control group and they obtained care from home care nurse for these problems and thus did not go to a health center; which made us think that planned home visits made after postpartum early discharge reduced the rate of hospital visits of puerperal women. Supporting the results of our research, it was, also, reported in other researches conducted over the same issue that home visits made by nurses after postpartum early discharge reduced the rate of hospital visits [12, 26, 27].

It was found out in the research that home care service given to the women who gave birth by cesarean delivery had a reducing effect on maternal problems after postpartum early discharge. Therefore, it may be recommended according to the results of the study that women who were early discharged from the hospital after cesarean section be provided with care and counseling through planned home visits.

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