



# International Journal of Nursing and Midwifery

Volume 9 Number 12, December 2017

ISSN 2141-2456



*Academic  
Journals*

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**ARTICLE**

**The effect of the health-based supportive plan on primiparous mothers' performance  
in neonatal care**

**136**

Sima Kermanshahi

*Full Length Research Paper*

# The effect of the health-based supportive plan on primiparous mothers' performance in neonatal care

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Received 8 July, 2015; Accepted 13 February, 2017

Infancy is the most vulnerable period of life often faced with mortality and morbidity. Appropriate care is important for maintaining and improving the health of newborns. Therefore, this study was designed to determine the effect of health-based supportive plan on the performance of primiparous mothers in the care of infants. This is a quazi-experimental study with two groups of intervention (30) and control (33) selected by census. Data were collected by a demographic information questionnaire designed to assess the primiparous mothers' knowledge and practice of infant care. The designed plan for the intervention group consisted of three stages (recognition, support and evaluation). The results were analyzed and compared with the control group by the SPSS software (ver. 16). Chi-square test demonstrated that the two groups were identical in terms of the demographic variables of age, job, education level and being a housewife. The knowledge level of performance in the two groups before intervention was not significant ( $p > 0.05$ ). The independent T-test and Chi-square showed significant differences between the maternal action and fetal complications in both groups after the intervention ( $p < 0.05$ ). The results showed that the designed plan was effective in maternal performance of infant care suggesting that the support program is an effective method for improving maternal and neonatal health.

**Key words:** Health-based supportive plan, primiparous mothers, neonatal care.

## INTRODUCTION

In all societies, improvement in individual health and wellbeing of both society and persons is crucial for maximum social and economic capacity. Infants' health determines the future of the country and is of special importance, indicating the health and welfare of the future of society (Mirgafoorvand and Mohammad Alizadeh, 2000). Childhood consists of several phases with the newborn period identified as the most vulnerable period needs to be recognized as a critical phase of

development for physiological accommodation for the out of uterus life and for potential congenital illness and other issues that threaten life and normal development. These occur more frequently in this period, as well as deaths and accidents when compared to other phases of life (Nelson Textbook of Pediatrics, 2006). The World Health Organization (WHO, 2012) has declared that annually approximately 40% of all deaths below the age of 5 occur foundation of infants' health (Beake et al., 2010). This

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among newborn infants that 3.4 of them die in the first week and more than 1.4 in the first 24 h after birth (Jehan et al., 2009; Boskabadi et al., 2010; Lawn et al., 2009). According to WHO, in the Islamic Republic of Iran, the rate of newborn death in 2006 was equal to 13.3 out of 1000 births (World Health Organization (WHO), 2008). Based on the statistics of the Ministry of Health in Iran, 13 to 15 newborns die per 24 h. In other words, about 20,000 newborns die before the age of one month annually (Ministry of Health, 2008). The mortality index in Tehran has been 23.8 since 1990. Despite the fact that newborn mortality has been increasingly declining in recent decades, it still accounts for 65% of deaths below the one year (Ghorat et al., 2016).

According to the WHO's "Hygiene for Everyone Program", the Third Millennium Development Goal, all countries in the world are committed to improve infants' health (World Health Organization, 2001), and infant mortality should be decreased by 2.3% up to 2015. To achieve this goal, mortality rate among newborns should decrease to less than 8 cases in 1000 births by 2015. Despite numerous activities during the two recent decades, the death index of newborns has not significantly decreased and has not met the Third Millennium Goal based on the WHO recommendations and international commitments. Effective interventions should be implemented with the aim of lessening newborn mortality (Kiasari et al., 2009). Previous studies show that newborn mortality can be prevented by up to 70% by improving conditions (Titaley et al., 2008). Reduction in newborn mortality rates has been noted with the implementation of special prenatal care (Ballard, 2000; Curley and Halliday, 2001; Eichenwald and Stark, 1999). Efforts must be made to prepare for protecting and promotion of a high level health in newborns as a vulnerable group requiring special attention in health care (Dadipoor et al., 2014). Inaccessibility of care in human violates the rights of the newborn. Care requires prioritizing hygiene and prevention as well as efficient treatment and training of persons in health care (Chiabi et al., 2014).

Therefore, mothers' health awareness and health care before and after childbirth affects mother's and infants' health, and is the most important factor in preventing undesirable health problem of the mother and newborn (Chiabi et al., 2014; Boskabadi et al., 2010). Many multiparous mothers are not necessarily ready for becoming a mother and need family, friends and assistance with hygiene (Cronin and McCarthy, 2003). Klein (1998) also believed that mothers usually feel weak after delivery and need more information for taking care of themselves and their children (Kline et al., 1998). In new postnatal situations, mothers are faced with responsibilities and new problems, creating the need for new knowledge (Mohseni et al., 2009). As primiparous mothers are inexperienced and may be unaware of what is needed, their level of readiness and awareness has an

important effect on the newborns' health. Thus it is necessary to pay more attention to mother and newborn health improvement programs. An evidence-based program to improve the mothers' performance of newborn care was designed with the aim of determining the effect of the health-based supportive plan on the performance of primiparous mothers in newborn care.

## MATERIALS AND METHODS

This study is a quazi-experimental intervention design that was conducted with the participation of 70 primiparous mothers in 2013 to 2014. Sampling was done by census method. Data collection tools consisted of a demographic questionnaire, knowledge assessment tool, and a mothers' performance checklist in the field of prevention and care of jaundice, colic, respiratory aspiration and diaper dermatitis. The validity of the data collection tools was established by the method of content validity and by 10 members of the faculty of the Department of Nursing and Midwifery of Medical Faculty of Shiraz and TarbiatModares University. The reliability of knowledge assessment tool was calculated as 0.84 through renewed examination with test -retest, and the reliability of performance tool through simultaneous examination between the two groups was 0.87.

The designed program consisted of three stages (recognition, support and evaluation) before and after childbirth. After entering the center, a list of all mothers that had inclusion criteria (being primiparous, singleton pregnancy, and mothers who were not physically or mentally impaired at pregnancy), was prepared. Their phone number was obtained, and next referral to the center was recorded. About the control group, the researcher referred to the center and talked with the mothers face to face about the program, and all of participants signed written informed consent prior to their participation. The demographic information questionnaire and educational need assessment were collected. After completing and delivering these questionnaires, a survey checklist of mothers' performance after childbirth was left with them, and how and when to complete it was explained. In the test group, explanations about the goals' study method and intervention time duration (from 7 to 8 months before delivery to one month after childbirth) were given to them. This was explained via phone, and questions were answered clearly to dissolve ambiguity.

They were then invited to the first session of the class. In the first session, the data of demographic information and the assessment questionnaire (related to jaundice, aspiration, colic and diaper dermatitis) were gathered to determine the educational needs of mothers and to compare the knowledge level of the two groups before beginning the intervention. The knowledge level of the two groups was compared with no significant difference. After the mothers' educational needs were identified, the intervention program in second stage (physical, educational and emotional support) started. Mothers who were 7 to 8 months pregnant were in the training class. The class period was 1 to 1.5 h. The elements of educational support for the intervention group included mothers' role and self-care in the recent months of pregnancy (proper breastfeeding, activity, etc.), type of delivery and benefits and problems, and postpartum self care (breast care, suture care, personal hygiene, and nutrition), as well as care of newborn (umbilical cord care, bathing, restraint of neonate, etc.). The program also delivered education on the mothers' role, the most relevant newborn problems (jaundice, infantile colic, dermatitis caused by clothing and aspiration), their causes and treatment, and the role of participating fathers to deliver emotional and physical support to the mother and newborn after childbirth. The classes were both theoretical and practical. The first 15 min of every

**Table 1.** Relative and absolute frequencies distribution of maternal in terms of demographic characteristics between the two groups.

Demographic data		Test	Control	$\chi$ square
Age	30 years<	26 (87)	27 (82)	0.59
	> 30 years	4 (13)	6 (18)	
	Total	30 (100)	33 (100)	
Literacy	< Diploma	5 (17)	6(18)	0.65
	Diploma	12 (40)	17(52)	
	>Bachelor	13 (43)	10(30)	
	Total	100	100	
Mothers' job	Housewife	28(93)	26(79)	0.16
	Employed	2(7)	7(21)	
	Total	100	100	
Delivery type	Normal delivery	9(30)	5(15)	0.22
	Elective caesarean	4(13)	9(27)	
	Emergency cesarean	17(57)	19(58)	
	Total	30 (100)	33 (100)	

session was allocated to review the information of the previous session, answer the mothers' questions, and correcting mothers' false beliefs. The learning level of the participants was evaluated by asking the mothers some specific questions. In these classes, the mothers talked about their anxieties related to childbirth and the expectations of health workers. At the end of each session, there was time for questions and discussion, and the time of the next session was determined with the mothers' agreement. Individual counsel, in person or by phone, was possible after class. At the last session, the mothers were instructed on how to use a performance checklist on newborn care. During the interval between finishing the classes and childbirth, there were contact with the mothers and they were asked their physical and mental health status; their anxiety and stress was decrease by talking with them and encouraging the fathers' to engage in the mothers' care. The mothers had given the nurse's phone number to one of their support persons who were instructed to call her whenever the mother's labor pain began. If it was possible and the authorities cooperated, the nurse visited the mothers in the maternity ward, tried to reduce their anxiety, and immediately after delivery, accompanied them to the ward.

The mother was asked to give an educational pamphlet to her husband in order to increase his knowledge. At least one postpartum home visit was made to all the women. Future visits depended on the nurses' discretion and if there were problems, the numbers of visits were increased. During the home visit, the mothers' total health and the newborns' health were assessed, and a record of the mothers' appetite, sleep and bowel status was taken. For the newborns, skin condition and signs of colic, mothers' capability to calm her neonate and bathing were assessed by the nurse on an observation form. During the home visit, the nurse assessed the maternal and neonatal complications and devised a care plan. If the problem did not clear up, the nurse then made a referral to the mother's need. This care continued to the end of the neonatal period. During the neonatal period, the mothers filled out the assessment performance checklist. The nurses phoned the mothers once a week to assess the relationship of mother and neonate, recall the mothers' essential caring points, and record her knowledge. The control group did not receive any of these interventions but their check lists were filled out independently and they were only called once after childbirth.

## RESULTS

Most of the participants in the test (87%) and control (82%) groups had less than 30 years, had diploma (test group 40% and control group 52%), and were housewives (test group 93% and control group 79%). Most of the participants in the test group (57%) and in control group (58%) have had emergency cesarean delivery, and the Chi-square test results showed no significant differences between the two groups in terms of delivery ( $p=0.22$ ). But the rate of normal delivery in the test group (30%) was more than in the control group (15%). The rate of elective cesarean in the test group (13%) was less than in the control group (27%). Also the rate of natural childbirth in the test group was twice the control group, and only 13% of the test group mothers' preferable childbirth has been cesarean, while in the control group, cesarean has been twice (Table 1).

Before intervention, 23.1% of the mothers in the test group and 18.6% of the mothers in the control group had good knowledge about neonatal care. Chi-square test showed there was no significant difference between the two groups before intervention in this regard ( $p=0.754$ ). That both groups had almost equal awareness level. After intervention, 87% of the mothers in the test group and 18% of the mothers in the control group had good knowledge about neonatal care. 73% of the mothers in the test group and 10% of the mothers in the control group had good performance about neonatal care. Chi-square test showed there was a significant difference in knowledge and performance between the two groups ( $p=0.001$ ) (Tables 2 and 3). According to the results, the mothers' performance in preventing and treatment of colic ( $p=0.22$ ) and jaundice ( $P=0.04$ ) was significantly different in the two groups (Table 4). The rate



**Table 2.** The relative and absolute frequency in terms of mothers' knowledge in infants' care in two groups before and after intervention.

Knowledge level	Group			
	After intervention		Before intervention	
	Test	Control	Test	Control
Poor	6(20)	9(28)	0(0)	7(21)
Moderate	17(57)	18(54)	4(13)	20(61)
Good	7(23)	6(18)	26(87)	6(18)
Total	30(100)	33(100)	30(100)	33(100)
$\chi$ square	P=0.754		P=0.001	

**Table 3.** The relative and absolute frequency in terms of mothers' performance in infants' care in two groups after intervention.

Performance level	Group	
	After intervention	
	Test	Control
Poor	0(0)	22(66)
Moderate	8(27)	8(24)
Good	22(73)	3(10)
Total	30(100)	33(100)
$\chi$ square	P=0.001	

**Table 4.** The relative and absolute frequency in terms of mothers' Performance in "the colic and jaundice of infants" in two groups

Performance		Group				Chi-square test
		Test		Control		
		Absolute frequency	Relative frequency	Absolute frequency	Relative frequency	
Performance in colic	Desirable	3	67	2	17	(p=0.22)
	Undesirable	1	33	22	83	
	Total	4	100	24	100	
Performance in jaundice	Desirable	7	70	6	30	P=0.04
	Undesirable	3	30	14	70	
	Total	10	100	20	100	

of infection to respiratory aspiration in the control group was twice that of the test group. Regarding the mothers' performance in putting the head higher than the body and putting the pacifier in the neonate's mouth, there was significant relation ( $p=0.001$ ) (Table 5). According to the results, the mothers' performance in preventing skin infection (diaper dermatitis) in infants was significantly different in the two groups ( $p<0.05$ ) (Table 6).

## DISCUSSION

In this study, the effect of a health-based supportive plan

on primiparous mothers' performance in prevention of colic, aspiration, skin problems and care in jaundice was investigated. Mojalli et al. (2010) demonstrated that with increasing age and higher levels of education, mothers exhibit better performance. Therefore, by eliminating the effect of these variables on our results; the two groups were equal in all demographic variables and Chi-square test showed no significant relationship between the two groups. There was a significant statistical difference ( $p=0.04$ ) in the test group with more mothers employing correct strategies in care. This demonstrates the effect of the protective health improvement program on mothers' recognition of jaundice and its management and

**Table 5.** Absolute and relative frequency in terms of mothers' performance in infants' aspiration in the two groups.

Measurement in aspiration	Group				Chi-square test
	Test		Control		
	Yes	No	Yes	No	
Getting neonate to burp	30 (100)	0 (0)	33 (100)	0 (0)	P= 0/001
Putting a pacifier in to baby's mouth	7 (23)	23 (77)	25 (76)	8 (24)	P= 0/001
Positioning the child	26 (87)	4 (13)	11 (23)	22 (67)	P= 0/001

**Table 6.** Relative and absolute frequency distribution by mothers' performance in preventing skin infection (diaper dermatitis) in infants.

Mothers' performance in skin problems	Group				Chi-square test
	Test		Control		
	Yes	No	Yes	No	
Repetitively changing	30 (100)	0 (0)	30 (91)	3 (9)	P= 0/09
Use allergen detergents	5 (17)	25 (83)	19 (58)	14 (42)	P= 0/02
Washing after each bowel movement	30 (100)	0 (0)	25 (76)	8 (24)	P= 0/004
Putting in air	17 (57)	13(43)	9(27)	24(73)	P= 0/01

how this is reflected in their performance in newborn care. According to Hosseinzade et al. (2012), only 42% of mothers knew about neonatal jaundice (Hosseinzade et al., 2012). In addition, the findings of Saravi Ghaffari (2006) showed that 302 mothers (75.5%) had little, 93 (23.3%) had moderate and only 5 mothers had good awareness about neonatal jaundice (Ghafari et al., 2007). Hosseini and Nikbakht (2011) also reported that the measure of awareness and information about the nature of jaundice in the newborn period is minimal (Hosseini and Nikbakht, 2011).

This is during a time when the health of the newborns that have jaundice is critical and dependent on early diagnosis and treatment (Pang and Ling, 2000). Avasady et al. (2006) noted that traditional curing is an important factor in delaying going to the hygiene and cure stations in India (Awasthi et al., 2006). Pang and Ling (2000) and Chap Jambo (2008) showed that the traditional cure using medical plants has a significant relationship with severe neonatal jaundice (Pang and Ling, 2000; Chappjumbo and Ohanenye, 2008). In the present study, regarding not giving medical plants to newborns resulted in significant difference between the two groups. Results in the control group, were two times higher than in the test group (test group 30% and control group 63/3%). The increases in the control group were attributed to mothers not being aware, being impressible and accepting traditional beliefs. The results demonstrated that the rate of pulmonary aspiration in the control group was twice that of the test group, a clinically important finding. The Chi-square results confirmed the performance in aspiration prevention ( $p=0.001$ ). There was no difference between the two groups in making the newborn burp after feeding, and the reason is that

breastfeeding classes were attended in all centers. The mothers' performance in preventing respiratory aspiration had a positive effect on neonatal respiratory health. More mothers showed appropriate performance for preventing respiratory aspiration at home in the test group. Appropriate performance demonstrated in the test group included burping newborns after feeding and positioning the infant, The pacifier was given in 23.3% of the cases, while the desired mothers' performance in the control group was making the newborn burp after breast feeding. The Chi-square test results regarding the rate of skin infection demonstrated a significant difference between the two groups ( $p=0.02$ ), being three times more in the control group.

A significant difference was noted in the mothers' performance of washing the buttocks after every defecation of baby, allowing the genital area to air and not using allergen cleaning materials that cause skin problems. Decreasing skin infection in newborns occurred due to the correct performance of the mothers in the test group. This shows the effect of supportive teaching during the intervention. Caring points to mothers, investigating newborn skin position at home, performing primary care program when the primary sign was observed, and correcting mothers behavior prevented the occurrence of dermatitis diaper, and if any problem occurred, corrected primary care were employed, and simultaneously the nurse aids were used. Emdadi and Bazmazmun, (2005) emphasized teaching the mothers about infant hygiene to prevent dermatitis diaper (Emdadi and Bazmazmun, 2005). Renjinidevi (2005) investigated the effect of teaching mothers to prevent newborn infections and concluded that mothers' knowledge about dermatitis before and after the intervention had a

significant difference. In the present study, 3 infants in the test group and in the control group 12 infants had colic. According to these results, mother's performance in preventing and curing colic was significantly different ( $p=0/02$ ). 3 mothers in the test group performed the correct performance, however, one infant was referred to a physician and two other infants were cured with appropriate performance at home. In the control group, only 2 mothers used the appropriate performance, 10 mothers had undesired performance. The results showed that health based supportive plan before and after delivery and following the mother and baby at home help mothers' learn about the best performances. Also there was a significant difference between the two groups' regarding the behaviours of calming in the home atmosphere, not responding to the newborn's cries, putting the baby on its abdomen and going to the physician for curing colic. Both groups adhered to not eating flatulent foods and making the baby burp. The present knowledge indicates that curing behaviors, as well as consultive and trusted supports to parents are the most effective of all options. Furthermore, teaching the mothers about colic symptoms, and using health preventive correct behavior were considered. Also, the results showed that the average grade of mothers desired performance in taking care of a newborn in the test group was 18.1, and in the control group, it was 12/4. The independent t-test results showed a significant relationship between the two groups in this regard ( $p=0.001$ ). Most of the mothers in the test group (66.1%) had well performance while most of them others in the control group (64%) showed weak performance in taking care of the baby. In total, the results of the present research confirm the effect of health-based supportive plan in preventing the specific problems in infants and this is while prevention is prior to treatment. There was no limitation in this study.

## Conclusions

Teaching emotional and consultive support in the pregnancy period, continuing supports after childbirth and during home visiting after childbirth and following how mothers perform are effective in taking care of newborn. That is why the number of desired performance among the mothers in the test group is more than in the control group. Also supporting mothers in all dimensions is effective in helping them in taking care of themselves and their children and promoting quality of life. It is necessary to encourage nurses as a part of the medicine team to continually support mothers in this critical period after childbirth. This significantly helps mothers and newborns towards higher level of health improvement, increasing the quality of life, decreasing the possible side effects of childbirth and consequently, decreasing the mothers' and new borns' mortality. Improvement in the performance of

the mothers' in the present study as a result of health-based supportive plan implies that supporting mothers before childbirth and continuing these supports after birth, visiting newborn at home, and following, this program can be used in improving both mother and newborns' health and promoting their quality of life.

## CONFLICT OF INTERESTS

The author has not declared any conflict of interests.

## Ethics and consent

The study was conducted in accordance with the guidelines of the Declaration of Helsinki and was approved by the Institutional Review Board (IRB) of Tarbiat Modares University (Approval number: IR.TMU.REC. 1067779). All pertinent study information was explained to the patient about the nature, scope and objectives of the study and they were informed that rejection or withdrawal from the study will not affect any medical service provided. A summarized study information sheet was shown to all cases before obtaining their verbal agreement. Finally, an informed verbal consent was obtained and witnessed by the attending nurse. The IRB waived the requirement for taking a written consent as the research had minimal risk of harm to subjects and involved no risky procedures for which written consent is required.

## ACKNOWLEDGEMENTS


The authors are grateful to all midwives and nurses who conducted the plan, and to all the mothers who agreed to participate in this study. Research was supported by the Fund of the Tarbiat Modares University.

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