

Original Article

Assessment of the Effect of Nipple Care with Honey on Nipple Cracking

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Abstract

Objective: This is a randomized controlled study. The aim of the study is to analyze the effect of nipple care with honey on nipple cracking.

Method: The population of the study included the primiparous mothers who stayed in the obstetrics clinics of a university hospital and a public hospital between May 2014 and August 2014. The participating mothers were assigned to control and experimental groups, starting with the control group. The authors held interviews with the mothers and provided breastfeeding training using breastfeeding brochures. The mothers in the experimental group were informed about how to apply the honey. Then, one teaspoon of honey were applied to their nipples and areola three times a day. The researchers washed their nipples 30 minutes later. Nipple cracks in all mothers were checked on the third, fifth and seventh days.

Results: Of the mothers in the experimental group, 30.4% had cracks on their nipples, and 76.5% did not. Of the mothers in the control group, 69.6% had cracks on their nipples, and 23.5% did not. The difference between the two groups was statistically significant ($p < 0.01$).

Conclusion: The authors found that nipple care with honey helped to prevent nipple cracks.

Keywords: Nipple care, nipple cracks, medicinal use of honey, nursing care.

Introduction

Breast milk is vital during the first six months of a baby's life when growth and development are very fast. It is a liquid that includes many components (Coskun, 2003; Neyzi, 2004) such as lactose, unsaturated fatty acids and all essential amino acids (Donnet-Hughes et al., 2000; Taskin, 2009; Nikkhah, 2011). Moreover, breast milk provides all the growth factors and immunological components needed by

healthy infants (Leung & Sauve, 2005; Nikkhah, 2011). These qualities of breast milk; have led the World Health Organization (WHO), the United Nations Children's Fund (UNICEF) and the American Academy of Pediatrics (AAP) to declare it to be necessary and sufficient that infants be fed only with breast milk for the first six months (WHO 2009, Gartner et al., 2005). Feeding with breast milk reduces infant deaths caused by diarrhea and pneumonia and helps them

recover quickly from illness. Annually, 1.5 million infants worldwide die from diarrhea, respiratory infections and other infections because they are not fed with breast milk (WHO/UNICEF, 2004). Relevant studies in the developing countries reveal that infants who are not fed with breast milk are six to ten times more likely to die in the first few months after birth (WHO, 2009; Shams, 2011).

Although breastfeeding is a natural and self-developing process both for infants and mothers, mothers usually have simple problems that cause concerns and anxiety (Raising Children Network 2009). Some of these problems are plump breasts, inverse nipples and nipple pain and nipple cracking (Unsal Atan & Sirin, 2008; Raising Children Network, 2009; Taskin; 2009, Melli et al., 2007). Nipple pain and nipple cracking are common complaints among breastfeeding women, and they are two of the major reasons that mothers cease to breastfeed their infants (World Health Organization, 2001; Schultz and Hill, 2005; Walker, 2008). In particular, primiparous breastfeeding women have these problems three or six days after delivery (World Health Organization, 2001; Taskin; 2009).

Cracks and pain in the nipple are usually caused by breastfeeding trauma (Carvalhaes et al., 2007, Vieira et al., 2010). These problems may result from positioning the baby incorrectly, the breasts being too full, candidiasis (Gokmirza, 2007), lack of hygiene, soaps, lotions or perfumes, dry skin and eczema (Giugliani, 2004). Breast care after the delivery is important because it can prevent these causes of nipple cracks (AÇSAP, 2009). There are many techniques used in breast care. Creams, pomades, oil, lotions and moisturizers are among these techniques, but they are becoming less common, and being replaced by natural methods (Akkuzu & Taskin, 2000).

Honey therapies are among the most common traditional applications (Yapucu, 2004). Honey has been used in therapies for 5,000 years, and it one of the oldest

medications. (<http://honey.bio.waikato.ac.nz>) It is an old solution, which has been rediscovered, and used to treat wounds (Allen et al., 2000, Young, 2005). It has approximately 200 compounds in it, including amino acids, vitamins, minerals and enzymes. Honey is antibacterial and antioxidant. It also accelerates epithelialization and the recovery of wounds. It maintains its antibacterial quality even when diluted 10 times or more (Tursen, 2013; Molan, 2001; Robson et al., 2009). Honey also has osmotic effect, acidity, and hydrogen peroxide produced in enzymatic reactions and phytochemical activity (Molan, 2001). There are many studies of these advantages of honey, which have found that honey treatment enhances the healing of wounds (Molan, 2001; Misirlioglu et al., 2003; Gurdal et al., 2003; Yapucu, 2004; Iftikhar et al., 2010; Robson et al., 2009; Kumari & Nishteswar, 2012; Essa & Ebrahim, 2013). However, there are no studies in the relevant literature of honey's ability to prevent nipple cracks. This study analyzes honey treatment's ability to prevent nipple cracks.

Materials and Methodology

Population and Sample of the Study

The data were collected from a university hospital and a public hospital. This is a quasi-experimental study with a randomized controlled design. The participating mothers were assigned to control and experimental groups, starting with the control group.

The study population included mothers who stayed in the obstetrics clinics of the two hospitals between May 2014 and August 2014, and who had given birth recently. The study sample included 50 mothers who met the research criteria during the data collection, were capable of holding an interview in the first six hours after delivery and agreed to participate in the study.

Data Collection Criteria;

Being older than 18 years old,

Having a landline phone at home,

Having no speaking disabilities,
Being literate,
Giving birth in the thirty-seventh week of pregnancy or later,
Having normal nipples (flat, inverted and abnormally small or large nipples were excluded),
Having no redness or cracks on the nipple,
Having no neonatal complications with their infants,
Being capable of holding an interview in the first six hours after delivery,
Having no allergies to honey,
No diagnosis of diabetes.

Data Collection Tools

The authors used the 'Patient Information Form' and the 'Breastfeeding Brochure'. Honey was the initiative material of the study.

Patient Information Form: The authors created this form by referring to the studies in the relevant literature. Its questions were about the mothers' ages, educational levels, occupations, family and environment. It also asked them if they had obtained information about breastfeeding before delivery or information about breast care, the exact time of their delivery, when they breastfed their infants for the first time and breastfeeding their babies.

Breastfeeding Brochure: The authors created this brochure by referring to the studies in the relevant literature. It provides information about the benefits of breast milk, breastfeeding positions, the causes of nipple cracks and breast care to prevent cracks.

Honey: The authors used undiluted blossom honey in the study.

Data Collection Phases

In the first six hours after delivery, the authors held interviews with mothers who met the research criteria and agreed to participate in the study. The authors informed the mothers about the objective of the study

and obtained their verbal and written consent. The 'Patient Information Form' was filled out during the interviews. The authors provided breastfeeding training to all participating mothers about the benefits of breast milk and correct breastfeeding practice using the breastfeeding brochure. This training was done in person by EA, the author of this study, and a gynecology nurse in the patients' hospital rooms. (Figure 1).

The Experimental Group

The first honey treatment for the experimental group was done by the researcher at the hospital together with the mother. The mothers were taught every stage of the treatment. All the mothers in the experimental group treated their nipples with honey following the steps in Figure 2. The studies in the relevant literature report that honey can be used once to four times a day (Tursen, 2013; Molan, 2001), and the diameter of the areola around the nipple is two to six centimeters (Topal, 2008; Saatkaya, 2009). Based on this information, the researcher used her fingers to apply a teaspoon of honey to the nipples and areolae of mothers in the experimental group three times a day after breastfeeding (in the morning, at noon and in the evening). It was not necessary to clean the application area since the honey would either be absorbed by the skin or stick to the gauze dressing. However, the researcher ensured that the nipples were washed 30 minutes after the application so the infant could be fed. The mothers had the researcher's phone number so that they could contact her about breastfeeding issues. The researcher called the mothers every two days after the initial interview, learned about problems related to the infant or breastfeeding and any development of nipple pain or cracking and responded to questions posed by the mothers. The researcher found that these two major problems, which can prevent breastfeeding, were common in the first week after delivery (Akkuzu & Taskin, 2000; Coskun, 2003). The honey treatment was provided for seven days. When nipple cracks developed, the

honey treatment was terminated, and the mothers were advised to see a doctor.

The Control Group

The researcher did not treat the mothers in the control group. They called the mothers in this group every two days after the first interview, learned about any problems related to the infant and breastfeeding as well as any development of nipple pain or cracks and answered other questions. When nipple cracks developed, the mothers in this group were advised to see a doctor.

Five mothers in the experimental group forgot to do the honey treatment. The researcher could not contact four mothers in the control group for the second interview, and one mother asked to withdraw from the research. Thus, 10 participants left the research, and the study was completed with 40 participants (20 in the control group and 20 in the experimental group).

Ethical Considerations

The authors obtained approval from Ataturk University's Health Sciences Institute's Ethics Committee before conducting the study. After the Ethics Committee approval, the authors obtained written consent from Ataturk University Research Hospital and Nene Hatun Maternity Hospital. The authors also informed the participants about the objective of the study and obtained their verbal and written consent.

Data Analysis

The author analyzed the study's data using the SPSS program. The data were analyzed using percentages and the chi-square test.

Result

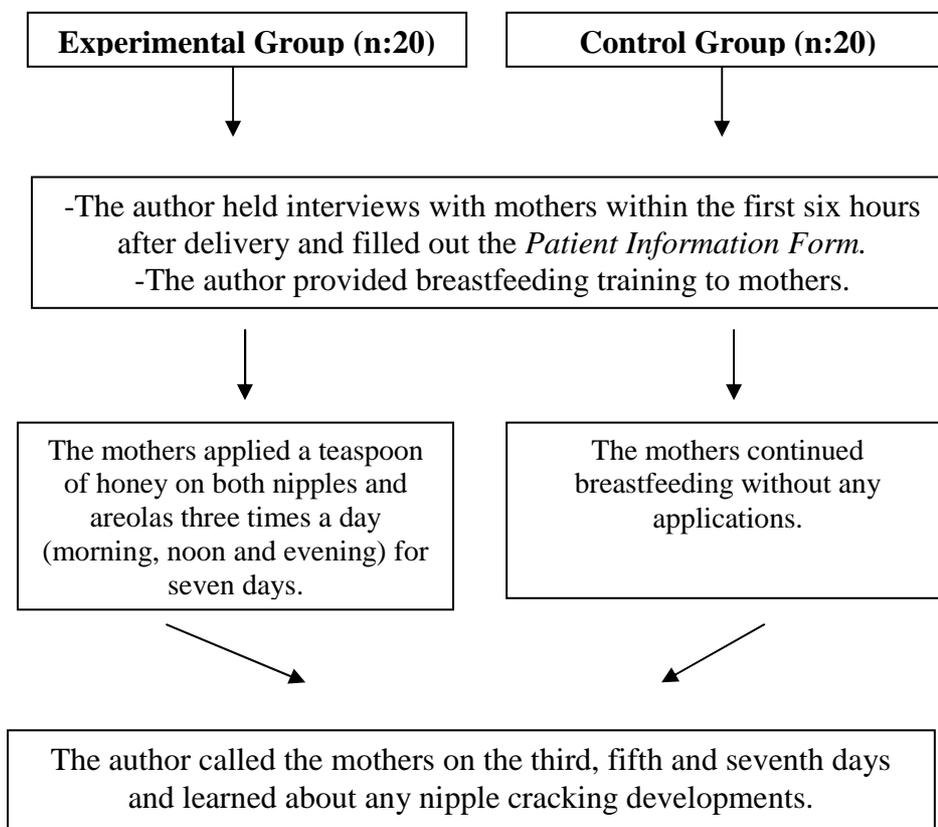
The distribution of the mothers' personal information is shown in Table 1. Of the participants in the experimental group, 30% are between 20 and 27 years of age, 45.5% are high school graduates or have undergraduate degrees, 45% got married between 15 and 22 years old, and 40% have been married for 6 to 11 years. Of the

participants in the control group, 45% are between 20 and 27 years of age, 55.5% are high school graduates or have undergraduate degrees, 50% got married between 23 and 30 years old, and 50% have been married for 11 years or longer. The author found no significant difference between the experimental and control groups regarding their personal information.

The distribution of the mothers' pregnancy traits is shown in Table 2. Of the mothers in the experimental group, 75% had 1 to 3 children, 55% had been to pregnancy checkups 5 to 10 times, 65% had never received breastfeeding training, and 60% had never received nipple care training. Of the mothers in the control group, 60% had 1 to 3 children, 75% had been to pregnancy checks 11 to 15 times, 60% had received breastfeeding training, and 80% had never received nipple care training. The author found no significant difference between the mothers in the experimental and control groups regarding their pregnancy traits.

The distribution of mothers' postpartum traits is shown in Table 3. Of the mothers in the experimental group, 65% gave their infants breast milk as their first food after delivery, 50% were able to give breast milk to their infants 121 to 240 minutes after delivery, and 40% fed their infants for 15 minutes on average. Of the mothers in the control group, 55.5% gave infant formula to their infants as their first food, 55.5% were able to give breast milk to their infants within 120 minutes after delivery, and 50% fed their infants for 10 minutes on average. There was no significant difference between the mothers in the experimental and control groups regarding their postpartum period traits.

A comparison of nipple cracks in the experimental and control groups is shown in Table 4. Of the mothers in the control group, 69.6% had cracks, while 23.5% had none. On the other hand, of the mothers in the experimental group, 30.4% had cracks, and 76.5% did not. The author determined that the difference between the two groups was statistically significant ($p < 0.01$).

Figure 1. Study Diagram**Figure 2. Honey Treatment Steps**

Equipment	Honey, teaspoon, bowl, gauze dressing.
Methodology:	Hands washed. The equipment prepared on a tray and checked.
	The mother assumes the correct position for the treatment.
	A teaspoon of honey is applied to both nipples and areolae with the fingers.
	Both nipples are covered with gauze dressing.
	Both nipples are washed with warm water 30 minutes after the application.
	Nipples covered with gauze dressing
	Nipples kept covered until next breastfeeding.
	The patient assumes a comfortable position. Hands washed.

Table 1. The Distribution of the Mothers' Personal Information

Personal Information	Experimental Group		Control Group		Test Value/Statistics
	N	%	N	%	
Age					
20-27	6	30.0	9	45.0	X^2 : 2.267
28-35	7	35.0	3	15.0	p: 0.322
36-42	7	35.0	8	40.0	
Educational Level					
Literate and Primary Education	11	55.5	9	45.5	X^2 : 0.400
High School and Undergraduate	9	45.5	9	45.5	p: 0,527
Employment Status					
Working	11	55.5	15	75.0	X^2 : 1.758
Not working	9	45.5	5	25.0	p: 0,185
Residence					
City	11	55.5	15	75.0	X^2 : 1.758
Town	9	45.5	5	25.0	p: 0,185
Family Type					
Nuclear Family	14	70.0	13	65.0	X^2 : 0.114
Extended Family	6	30.0	7	35.0	p: 0,736
Age of Marriage					
15-22	9	45.0	6	30.0	X^2 : 3.600
23-30	3	15.0	4	20.0	p: 0,235
31-38	8	40.0	10	50.0	
Length of Marriage					
1-5 years	7	35.0	8	40.0	X^2 : 5.333
6-11 years	8	40.0	2	10.0	p: 0,069
11 years or more	5	25.0	10	50.0	

Table 2. The Distribution of the Mothers' Pregnancy Traits

Personal Information	Experimental Group		Control Group		Test Value/Statistics
	S	%	S	%	
Desire for Pregnancy					
Yes	15	75.0	12	60.0	X^2 : 1.026
No	5	25.0	8	40.0	p: 0,311
Number of Pregnancies					
1-3	15	75.0	12	60.0	X^2 : 1.026
4 and more	5	25.0	8	40.0	p: 0,311
Abortions in the Past					
Yes	7	35.0	8	40.0	X^2 : 0.107
No	13	65.0	12	60.0	p: 0,744
Number of Routine Checkups During Pregnancy					
5-10	11	55.0	15	75.0	X^2 : 1.758
11-15	9	45.0	5	25.0	p: 0,185
Institution for Checkups					
Hospital	13	65.0	14	70.0	X^2 : 0.253
Primary Health Care Center and Hospital	7	35.0	6	30.0	p: 0,615
Breastfeeding Training					
Yes	7	35.0	12	60.0	X^2 : 2.506
No	13	65.0	8	40.0	p: 0,113
Nipple Care Training					
Yes	8	40.0	4	20.0	X^2 : 0.1905
No	12	60.0	16	80.0	p: 0.168

Table 3. The Distribution of the Mothers' Postpartum Traits

Personal Information	Experimental Group		Control Group		Test Value/Statistics
	S	%	S	%	
The First Food Given to the Infant					
Infant formula	7	35.0	11	55.5	$X^2: 0.912$ p: 0,089
Breast milk	13	65.0	9	45.5	
The Duration before Breastfeeding the Infant for the First Time (minutes)					
0-120	5	25.0	11	55.0	$X^2: 6.110$ p: 0,047
121-240	10	50.0	3	15.0	
241-360	5	25.0	6	30.0	
Infant's Desire to Be Fed					
Eager and Strong	5	25.0	11	55.0	$X^2: 5.850$ p: 0,054
Unwilling and Sleepy	7	35.0	7	35.0	
Did not accept breast milk	8	40.0	2	10.0	
Number of Breastfeeding Sessions					
1-2					$X^2: 0.619$ p: 0,734
3-4	7	35.0	5	25.0	
4-6	7	35.0	7	35.0	
	6	30.0	8	40.0	
Average Duration of Breastfeeding					
5 minutes	5	25.0	5	25.0	$X^2: 5.542$ p: 0,068
10 minutes	7	35.0	10	50.0	
15 minutes	8	40.0	5	25.0	

Table 4. A Comparison of Nipple Cracks in the Experimental and Control Groups

	Experimental Group		Control Group		Test Value /Statistics
	S	%	S	%	
Have Cracks	7	30.4	16	69.6	$X^2: 15.964$ p: 0,004
Do Not Have Cracks	13	76.5	4	23.5	
Total	20	100.0	20	100.0	

Discussion

This study examined the development of nipple cracks in mothers who received and did not receive honey treatment and discusses the results based on the relevant literature. The study compared the characteristics of the experimental and control groups (Tables 1, 2 and 3). The author found that there was no statistically significant differences between the two groups regarding their demographic information, pregnancy traits and postpartum traits, and that the groups had similar distributions. The cracks and pain in the nipples may due to many reasons such as inexperience, initiating breastfeeding late, incorrect breastfeeding positions (Taskin, 2009), the lack of extensive breastfeeding training before and after delivery and long breastfeeding sessions (Henderson et al., 2001; Schultz & Hill, 2005) and the mothers being primiparous (Li et al., 2008). Considering these causes, the similarity between the groups is important.

A correct breastfeeding position and extensive training on breastfeeding and nipple care can significantly reduce rates of nipple pain and crack development (Henderson et al., 2001; Schultz & Hill, 2005). The only important issue in breast care is cleanliness because the Montgomery tubercles secrete an oily and smelly antibacterial substance that protects and lubricates the nipple and areola (Erenel et al., 2010). Thus, mothers should wash their hands and clean their breasts with water before feeding the infant. They should also dry the nipple after washing it (Fraser & Cullen, 2008). Excess moisture increases the risk of nipple cracks and allows the microorganisms reproducing there to penetrate more easily (Kohlendorfer et al., 2008). The author gave breastfeeding training with information like this to all mothers before the study was conducted so that they could learn about correct breastfeeding technique. This also equalized the experimental and control groups. The author intended this training to eliminate nipple cracks due to incorrect breastfeeding techniques.

Of the mothers in the control group, 69.6% had cracks in their nipples, while this rate was 30.4% in the experimental group. The difference between the two groups is statistically significant ($p < 0.01$). One of the major causes of nipple cracks is dehydration of the nipple. The osmotic effect of honey moisturizes the area (Dunford et al., 2000; <http://www.frevas.demon.co.uk/honey>), reducing the development of cracks. Other major

reasons for nipple cracks are traumas and frictions that develop after the nipple dries (Taskin, 2009).” The moisturized environment created by honey prevents maceration and the development of cracks. Another effect of honey is to accelerate circulation in capillary veins (Dunford et al., 2000; Al-Waili et al., 2011, <http://www.worldwidewounds.com>, <http://www.frevas.demon.co.uk/honey>, Molan, 2002). Honey accelerates blood circulation in the nipple, thus preventing the development of cracks by helping the area to be oxygenated. Edemas in the nipple also cause an incorrect breastfeeding position that leads to pain and cracks in the nipple (Taskin, 2009). Since honey prevents edemas (Al-Waili et al., 2011, <http://www.worldwidewounds.com>, <http://www.frevas.demon.co.uk/honey>, Molan, 2002), it reduces the development of nipple cracks. Considering honey’s level of antibacterial activity, it is capable of inhibiting some common types of bacteria, even if it is diluted 10 or more times (Molan, 2001b; Dunford et al, 2000). This is another aspect of honey that makes it important in nipple care. Some relevant studies of honey (Mısrıhıoglu et al., 2003; Gurdal et al., 2003; Yapucu, 2004; Robson et al., 2009; Iftikhar et al., 2010; Kumari & Nishteswar, 2012; Essa & Ebrahim, 2013) have also found that it has positive effects when used for the recovery of wounds.

Conclusion and Suggestions

Of the mothers who received honey treatment, 30.4% had nipple cracks. Of the mothers who did not receive honey care, 69.6% had nipple cracks. To conclude, the study found that applying honey to the nipples reduces the development of nipple cracks.

The author suggests that honey treatment be used at the beginning of breastfeeding process along with breastfeeding technique training as a protective measure against nipple cracks. Future studies should be conducted with larger samples to determine the effect of honey on the development of nipple cracks.

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