



The Effect of Silver Nipple Cups in Nipple Care: Insights from Breastfeeding Mothers

Meme Başı Bakımında Gümüş Kapak Etkisi: Emziren Annelerin Görüşleri

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ABSTRACT

Aim: Breastfeeding, which is the ideal feeding method for babies, has many benefits for both babies and mothers. However, nipple problems during breastfeeding can cause early weaning. One of the methods used for nipple care is the use of silver nipple cups. In this study, we aimed to evaluate the experiences of breastfeeding mothers using silver cups for nipple care.

Material and Method: Mothers contacted via social media were asked to participate in a structured survey consisting of 33 questions related to breastfeeding, nipple care and silver cups use.

Results: A total of 298 mothers participated in the study. There was no significant difference between mothers who used silver caps and those who did not in terms of demographic characteristics, breastfeeding initiation time, frequency, duration and milk expressing. Ninety three percent (n=290) of mothers used at least one method for nipple care. The first three commonly used methods for nipple care were lanoline (52.2%), breastmilk (51.2%) and silver cups (49.8%). It was reported by 36.6% (n=109) of mothers that they have not experienced any nipple problems. Among the 147 mothers who had used silver cups 89.9% (132) claimed that this method was effective for them. There was no difference between the frequency of nipple fissures in mothers using silver cups when compared to mothers who did not use it.

Conclusion: Nipple fissure is one of the most common causes of early weaning. Mothers use many methods for nipple care. Silver cups is one of the methods preferred by mothers for the prevention of nipple fissures and is considered to be beneficial.

Keywords: Breastfeeding, nipple fissure, nipple problems, silver cups, weaning

ÖZ

Amaç: Bebekler için ideal beslenme yöntemi olan emzirmenin hem bebekler hem de anneler için birçok faydası bulunmaktadır. Ancak emzirme sırasında oluşan meme ucu problemleri erken süttten kesilmelere neden olabilmektedir. Meme başı bakımında kullanılan yöntemlerden biri de gümüş meme ucu kapağı kullanımıdır. Bu çalışmada, meme başı bakımı için gümüş kapak kullanan annelerin deneyimlerinin değerlendirilmesi amaçlanmıştır.

Gereç ve Yöntem: Sosyal medya aracılığıyla ulaşılan anneler 33 sorudan oluşan emzirme, meme başı bakımı ve gümüş kapak kullanımı ile ilgili yapılandırılmış ankete katılmaya davet edilmiştir.

Bulgular: Çalışmaya toplam 298 anne katıldı. Gümüş kapak kullanan ve kullanmayan anneler demografik özellikler, emzirme başlama zamanı, sıklığı, süresi ve süt sağma açısından aralarında anlamlı fark bulunmadı. Annelerin %93'ü (n=290) meme başı bakımı için en az bir yöntem kullanmıştı. Meme ucu bakımı için en sık kullanılan üç yöntem lanolin (%52.2), anne sütü (%51.2) ve gümüş kaplar (%49.8) olarak belirlendi. Annelerin %36.6'sı (n=109) herhangi bir meme başı problemi yaşamadığını bildirdi. Gümüş kapak kullanan 147 annenin %89.9'u (132) bu yöntemin kendileri için etkili olduğunu ifade etti. Gümüş kapak kullanan ve kullanmayan anneler arasında meme başı çatlağı sıklığı açısından fark bulunmadı.

Sonuç: Meme başı çatlakları, emzirmenin erken kesilmesinin en yaygın nedenlerinden biridir. Anneler meme başı bakımı için birçok yöntem kullanmaktadır. Gümüş kapak, anneler tarafından meme başı çatlağının önlenmesi için tercih edilen ve faydalı olduğu düşünülen bir yöntemdir.

Anahtar Kelimeler: Emzirme, meme başı çatlağı, meme başı sorunları, gümüş kapak, süttten kesme

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INTRODUCTION

Breastfeeding ensures the best nutrition, growth and development of the baby and protects the baby and mother from some diseases and infections (1). The World Health Organization (WHO) recommends that infants be breastfed exclusively for the first six months of life and then, when complementary foods have been introduced, continue to be breastfed until aged two years or beyond (2).

Despite the benefits of breastfeeding for both mothers and infants, breastfeeding problems such as nipple fissures, engorgement and mastitis can result in early weaning (3). Especially nipple pain and damage is common in breastfeeding mothers. It is estimated that 80–90% of breastfeeding mothers experience nipple pain, which may be associated with low milk supply, mood disruption, and increased risk of early cessation of breastfeeding (4). A study in the United States found that more than a quarter of mothers who ceased breastfeeding within the first month postpartum reported 29.3% nipple pain, and 36.8% experienced pain, fissures, or bleeding from the nipples (5). In another study, exclusive breastfeeding for less than a month was associated with nipple pain (6).

The most common attributed cause of nipple pain was incorrect positioning and attachment, followed by improper expressing techniques, tongue tie, infection, palatal anomaly, flat or inverted nipples, mastitis, and vasospasm (7).

Treating nipple fissure trauma quickly is an important factor in establishing successful breastfeeding and preventing complications such as mastitis or abscesses. Topical creams, solutions or sprays, exposing nipple to dry heat or UV light, air drying, pre- or postnatal breastfeeding education, nipple shells, hydrogel, adhesive polyethylene film wraps and distilled water are some of the widely-used available treatments and prevention options for nipple fissures (8).

Silver nipple cups are also used to prevent and treat nipple fissures. It is speculated that the benefits of using silver cups are due to their mechanical covering effect against possible trauma and preventing the entry of microorganisms. It is also important to maintain a moist healing environment for optimal healing of the nipple. The moist and hypoxic environment provided by silver nipple shields also helps the healing process and the hypoxic environment prevents the growth of aerobic microorganisms (4). Along with the benefits of silver cups device, its trilaminar structure which prevents the absorption of silver ions into the systemic circulation provide be safe (3).

The aim of this study was to evaluate the experiences of breastfeeding mothers who used silver cups to prevent nipple fissure.

MATERIAL AND METHOD

The study was carried out with the permission of İstanbul Medipol University Non-interventional Clinical Researches Ethics Committee (Date: 03.03.2022, Decision No: 214). All procedures were carried out in accordance with the ethical rules and the principles of the Declaration of Helsinki. All participants provided informed consent prior to the survey.

This cross-sectional study was conducted between March 15 and May 15, 2022. Mothers aged between 18 and 46 who voluntarily agreed to participate were included in the study. Participants were recruited through social media platforms, specifically WhatsApp and Instagram. To minimize selection bias, recruitment messages were disseminated across various social media groups with diverse demographic compositions, ensuring a broader representation of the target population.

The study utilized a structured questionnaire consisting of 33 items designed to assess the experiences of mothers who had used nipple care methods, including silver nipple cups, for at least one month. The questionnaire covered demographic characteristics, breastfeeding education, initiation time and duration of breastfeeding, use of pacifiers and bottles, expressing, Oral problem in infant, breastfeeding counselling, methods used for nipple care, features of the use of silver cup (source of information, place of purchase, time of initiation, duration of use and maternal satisfaction), presence of nipple redness or bruise or nipple fissure in the mothers using silver cups. Direct assessment of infant positioning and latching could not be performed in our study.

To ensure the validity and reliability of the questionnaire, a pilot test was conducted with 15 participants before full-scale data collection. This pilot test helped refine the clarity and comprehensibility of the questions. At the beginning of the survey, participants were provided with detailed information about the study, and informed consent was obtained before proceeding with the questionnaire.

Statistical analysis

SPSS Statistics (IBM version 22.0) was used for the statistical analyses. Kolmogorov-Smirnov test was used to test the normality of the variables, Mann-Whitney U test was used for the comparison of the quantitative values of the categorical variables that were not normally distributed. Chi-square or Fisher's Exact tests were used for the comparison of the categorical variables. P value was less than 0.05 was accepted as statistically significant.

RESULTS

The mean age of the 298 mothers was 32.93 (21-46) and 147 (4.32%) of the mothers used silver cups. Ninety three percent (n=290) of mothers used at least one method for nipple care. The first three used methods for nipple care were lanoline (52.2%), breastmilk (51.2%) and silver cups (49.8%). The general findings are presented in **Table 1**.

Table 1: General features		
	Mean±std	Median
Mother age (year)	32.93±4.15	32.00
Baby age (month)	10.0±7.5	8.0
	n	%
Education		
Primary school	3	1.0%
High school	23	7.7%
University degree	272	91.3%
Number of pregnancies		
1	207	69.5%
2	71	23.8%
≥3	20	6.7%
Nipple fissurs history		
Yes	70	23.5%
No	228	76.5%
Breastfeeding starting time		
First hour	198	66.4%
First day	72	24.2%
After 24 hours	28	9.4%
Pacifier use		
Yes	102	34.2%
No	196	65.8%
Bottle use		
Yes	93	31.2%
No	205	68.8%
Expressing breast milk		
Yes	87	29.2%
No	211	70.8%
Expressing method		
Hand expression	3	3.4%
Hand pump	10	11.5%
Electrical pump	74	85%
Frequency of expressing		
Everyday	30	34.5%
Less than 3 days per week	11	12.6%
More than 3 days per week	10	11.5%
When necessary	36	41.4%
Oral problem in infant		
None	255	85.6%
Tongue-tie	21	7.0%
Cleft lip/ palate	0	0.0%
Breastfeeding Counselling		
Yes	126	42.3%
No	172	57.7%
Nipple care		
Yes	290	97.3%
No	8	2.7%
Nipple care methods		
Lanoline	154	52.2
Breastmilk	151	51.2
Silver Cup	147	49.8
Only water	102	34.6
Water and soap	102	34.6
Breast Pads	87	29.5
Breast Shield	66	22.4
Olive Oil	48	16.3
Quince Seed	40	13.6
Garmastan ®	35	11.9
Madecassol ®	33	11.2
St. John's Wort	21	7.1

The characteristics of mothers who used silver cups and those who did not are shown in **Table 2**. No significant correlation was found between the two groups except for prematurity of the baby ($p<0.05$).

There was no significant difference between mothers regarding pacifier and bottle use and frequency and technics of milk expressing ($p>0.05$) (**Table 3**).

Data on the use of the silver cups are shown in **Table 4**. The main source of information for 46.9% mothers about using silver cups was the internet. It was recommended by friends/relatives in 38.8% of the cases, by a lactation consultant in 7.5% and by a health worker in 6.8%. The silver cups were purchased from the internet in 59.2% of cases and started to be used after pregnancy in 74.8% of the cases. While 21.1% of the mothers used silver cups for one month, 12.9% used it for more than six months. Of the mothers who used silver cups, 132 (89%) thought that this method was helpful in preventing nipple fissures.

Nipple fissure was reported in 54.4 % of mothers who used silver cups and 57 % of mothers who did not use silver cups and there was no difference between the frequency of nipple fissures or nipple redness/bruise in both groups (**Table 5**).

In mothers who used silver cup, there was no significant association was found between nipple fissure and maternal age, education, number of pregnancies, and expression, whereas a statistically significant association was found with the presence of a history of nipple fissure ($p<0,001$) (**Table 6**).

Table 4 : Features of the use of silver cups		
	n	%
Information source		
Internet	69	46.90
Friend / relative	57	38.80
Lactation consultant	11	7.50
Healthcare professional	10	6.80
Purchased from		
Internet	87	59.20
Baby stores	27	18.40
Gift	24	16.30
Pharmacy	9	6.10
Time of initiation		
After pregnancy	110	74.80
During pregnancy	37	25.20
Duration of use		
Less than 1 month	23	15.60
1-3 months	77	52.40
3-6 months	28	19.00
More than 6 months	19	12.90
Maternal satisfaction		
Yes	132	89.80
No	15	10.20

**Table 2: Characteristics of mothers with and without silver cups**

	Using Silver Cup				Total (n)	Total (%)	χ^2	P*
	Yes		No					
	n/mean \pm SD	% (min-max)	n/mean \pm SD	% (min-max)				
Age	33.11 \pm 4.19	21-46	32.75 \pm 4.11	24-46				0.27**
Education							8.96	0.11
Primary school	0	0,0	3	2,0	3	1,0		
High school	6	4,1	17	11,3	23	7,7		
University degree	6	4,10	20	13,2	26	8,70		
Under-graduate	61	41,5	65	43,0	126	42,3		
Post-graduate	80	54,4	66	43,7	146	49,0		
Number of Pregnancies							5.94	0.05
1	111	75,5	96	63,6	207	69,5		
2	30	20,4	41	27,2	71	23,8		
≥ 3	6	4,1	14	9,3	20	6,7		
Gestation							4.69	0.03
<37	10	6,8	22	14,6	32	10,7		
>37	137	93,2	129	85,4	266	89,3		
Nipple fissure history							0.02	0.88
No	113	76,9	115	76,2	228	76,5		
Yes	34	23,1	36	23,8	70	23,5		
Oral problem in infant							0.27	0.87
None	125	85,0	130	86,1	255	85,6		
Tongue-tie	10	6,8	11	7,3	21	7,0		
Cleft lip/ palate	0	0,0	0	0,0	0	0,0		
Breastfeeding Counselling							0.04	0.84
No	84	57,1	88	58,3	172	57,7		
Yes	63	42,9	63	41,7	126	42,3		

*Chi-square test, **Man-Whitney-U test

Table 3: Data about breastfeeding experience

	Using Silver Cup				Total (n)	Total (%)	χ^2	P*
	Yes		No					
	n	%	n	%				
Pacifier use							0.43	0.51
Yes	53	36,1	49	32,5	102	34,2		
No	94	63,9	102	67,5	196	65,8		
Bottle use							0.52	0.47
Yes	43	29,3	50	33,1	93	31,2		
No	104	70,7	101	66,9	205	68,8		
Expressing breast milk							0.62	0.43
Yes	46	31,3	41	27,2	87	29,2		
No	101	68,7	110	72,8	211	70,8		
Expressing Method							2.37	0.55
Hand expression	1	2,2	2	4,9	3	3,4		
Hand pump	7	15,2	3	7,3	10	11,5		
Electrical pump	38	82,6	36	87,8	74	85		
Frequency of expressing							4.33	0.23
Everyday	14	30,4	16	39,0	30	34,5		
Less than 3 days per week	6	13,0	5	12,2	11	12,6		
More than 3 days per week	3	6,5	7	17,1	10	11,5		
When necessary	23	50,0	13	31,7	36	41,4		

*Chi-square test

Table 5: Comparison of nipple problems

	Using silver cup				χ^2	P*
	Yes		No			
	n	%	n	%		
Presence of nipple redness or bruise					1.04	0.31
Yes	89	60.5	100	66.2		
No	58	39.5	51	33.8		
Nipple fissure					0.19	0.66
Yes	80	54.4	86	57.0		
No	67	45.6	65	43.0		

*Chi-Square test

Table 6: Factors associated with nipple fissure in mothers using silver cups

	Nipple Fissure		χ^2	P*
	Yes (n %)	No (n %)		
Education			0.567	0.753
Primary	15 (57.7 %)	11 (42.3 %)		
Undergraduate	67 (53.2 %)	59 (46.8 %)		
Graduate	84 (57.5%)	62 (42.5%)		
Number of Pregnancy			0.640	0.726
1	114 (55.1%)	93 (44.9%)		
2	42 (59.2%)	29 (40.8%)		
≥ 3	10 (50.0%)	10 (50.0%)		
Nipple fissure history			21.886	<0.001
Yes	110 (48.2%)	118 (51.8%)		
No	56 (80%)	14 (20.0%)		
Expressing breast milk			0.399	0.528
Yes	120 (56.9%)	91 (43.1%)		
No	46 (52.9%)	41 (47.1%)		

*Chi-square test

DISCUSSION

Common nipple pain and damage in breastfeeding mothers may be associated with an increased risk of early cessation of breastfeeding (4). The most common causes of nipple fissure were incorrect positioning and improper suckling, followed by tongue tie, inappropriate expressing techniques, nipple infection, use of pacifier or bottle (4,7). A history of nipple fissure was found in 23.5% of the 298 mothers in our study, The rates of pacifier and bottle use were 34.2% and 31.2%, respectively. It was found that 29.2% of all mothers were milk expressing. Tongue tie was present in 7% of the babies.

Proper counseling about breastfeeding, alongside continuous support from educated health care professionals, proved to be the most effective method for preventing damaged nipples (6,9). In our study, 42.3% of the mothers received breastfeeding support.

Various methods are used during the breastfeeding period for the prevention and treatment of nipple fissures. Although literature presents mixed results, interventions such as tea compresses, hot and cold local applications, peppermint juice, lanolin, olive oil, vernix caseosa, and hydrogel compresses have been explored in recent years (10-12). A recent study found both lanolin and

human milk are equally effective in treating painful and damaged nipples (13). Maleki et al. (14) reported that aloe vera may be a beneficial option for reducing nipple pain and irritation, demonstrating significant improvement compared to routine care. Additionally, studies suggested that cocoa butter and beeswax may help prevent nipple fissures (15,16). In our study, 97.3% of mothers (n=290) reported using at least one method for nipple care. The first three methods used for nipple care were lanolin (52.2%), breast milk (51.2%) and silver cups (49.8%).

One of the methods applied in nipple care and fissures is the use of silver cups. Silver cover creates a barrier that accelerates wound healing and reduces the risk of infection. A study involving 40 women with symptomatic nipple fissures found that silver cups led to a more rapid resolution of painful symptoms, bleeding, and nipple fissures compared to applying only breast milk (8). The preventive effect of silver cups on nipple fissures is also significant. A recent study evaluating 99.9% pure silver trilaminar cups found that they effectively prevented nipple pain and fissures, with 98.8% of users reporting symptom relief and no adverse effects observed (17).

In our study, no significant difference was found between mothers who used silver cups and mothers who did not use silver cups in terms of pacifier and bottle use, frequency and techniques of expressing milk. In addition, it was found that 46.9% of the mothers obtained information about silverware from the internet, 25.2% started using silvercups after pregnancy, and 52.4% used silvercups between 1-3 months. The fact that there was no statistically significant difference in the frequency of nipple fissures between silver cup users and non-users suggests that silver cups may be more useful in relieving symptoms rather than preventing them. Similarly, Charehsaz et al. (18) reported that silver-made nipple caps exhibit antimicrobial properties and are biocompatible; however, their efficacy in preventing nipple fissures remains inconclusive. These findings suggest that silver cups may primarily aid in symptom relief rather than prevention, highlighting the need for further large-scale, controlled clinical trials to establish their preventive potential.

On the other hand, in a study investigating the risk factors for nipple fissure, it was found that a history of nipple fissure increased (19). In our study, similar results were obtained when the groups using silver cup and not using silver cup were compared.

The strength of our study is that, to our knowledge, it is the first study in Turkiye to investigate the use of silver cups in reducing the frequency of nipple fissures. Our study was shared on different social media groups, which may have helped us reach mothers from different socio-demographic groups. However, the fact that participants participated in the survey based on their own preferences (self-selection bias) and that mothers using certain platforms participated more in the study may limit the representativeness of the results.



CONCLUSION

Nipple fissure is one of the most common causes of early weaning. Mothers use many methods for nipple care. Silver nipple cups are one of the methods preferred by mothers in the prevention of nipple fissures and it is reported to be beneficial. Large-scale clinical trials are needed to determine the efficacy of silver cups in nipple care and pain.

ETHICAL DECLARATIONS

Ethics Committee Approval: The study was carried out with the permission of Istanbul Medipol University Non-interventional Clinical Researches Ethics Committee (Date: 03.03.2022, Decision No: 214).

Informed Consent: All patients signed the free and informed consent form.

Referee Evaluation Process: Externally peer-reviewed.

Conflict of Interest Statement: The authors have no conflicts of interest to declare.

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