DOI: 10.5152/etd.2018.18080

Manuscript Type: Original Article

Title: Knowledge, Attitude, and Practices about Wet-Nursing and Human Milk Banking in Kayseri, Turkey

Running Head: Wet-Nursing and Human Milk Banking

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Cite this article as: Yılmaz M, Aykut M, Şahin H, Ongan D, Balcı E, Gün İ, et al. Knowledge, Attitude, and Practices about Wet-Nursing and Human Milk Banking in Kayseri, Turkey. Erciyes Med J 2018; DOI: 10.5152/etd.2018.18080

ABSTRACT

Objective: The aim of the present study was to determine the knowledge, attitude, and practices of mothers about wet-nursing and human milk banking in Kayseri, Turkey.

Materials and Methods: This descriptive study was conducted in the family healthcare centers of four community health care centers in Kayseri Province. The questionnaire form was fulfilled with face-to-face interviews of 614 participants.

Results: Of the mothers, 88.9% had heard about wet-nursing, 10.9% had a wet-nurse of her own, 5.2% had a wet-nurse of her child, and 5.0% had been a wet-nurse of another child. Wet-nurses were chosen mostly from relatives. Of the mothers, 93.6% stated that they had not heard about milk banking, whereas 97.2% did not know its purpose and services. More than half of the mothers (61.6%) thought human milk banking as a right application, whereas 75.4% of the mothers who thought that it was not right were against it because they believed marriage between foster milk siblings was religiously forbidden. Most of the mothers (79.8%) stated that they could milk for another child, and 56.2% identified that they could donate breast milk to the human milk bank.

Conclusion: More than half of the mothers thought that milk banking was a correct application. Mothers who were opposed to milk banking showed religious justifications as reasons. Placing the subjects “milk banks” and “human milk donorship” during education on breast milk in hospitals is important in terms of increasing the awareness of mothers.

Keywords: Breast milk, milk banks, wet-nursing

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INTRODUCTION

Breast milk is universally accepted as the best nutritional source for the first 6 months of life and a dietary part of a healthy baby for ≥2 years. Breast milk is specific to humans; therefore, it is superior to all other alternatives for newborn nutrition (1). Problems induced by mother or baby during lactation negatively affect exclusive breast feeding and duration of total lactation. In such cases, to milk, wet-nursing, human milk banking applications in order to feed babies with breast milk can be put into use (2).

A wet-nurse is a woman who breastfeeds a child of another mother who cannot breastfeed. For ages, "wet-nurses" were applied when human milk could not be provided (3, 4). Human milk bank is an institution that has been constituted to collect, process, store, and distribute donated human milk for meeting specific requirements of whom licensed health care professionals prescribed human milk (5). Human milk banking actually had been started in Hammurabi's time with wet-nurses. After Theodor Escherich, who discovered *Escherichia coli*, recognized that the mortality rates of babies who were given food except for human milk were high, he founded the first human milk bank in 1909 in Vienna (6). The first human milk bank in the USA was founded in 1919 in Boston as a house designed for lactating mothers who were wet-nursing for money. While there were 30 human milk banks in the USA in the early 1980s, this number has decreased to seven because they were closed due to the fear of human immunodeficiency virus transmission (5, 6). The Human Milk Banking Association of North America (HMBANA) was founded in 1985. Currently, there are 24 non-profit milk banks associated with the HMBANA in the USA (7). With the collaboration of the Food and Drug Administration, Centers for Disease Control and Prevention, and American Academy of Pediatrics representatives, the guidelines for collecting, processing, and distributing donated human milk were developed and published in 1990 (5, 6). There are 226 human milk banks in Europe; in addition, there are 16 that are planned to be founded (8). The first human milk bank has been established at the Dr. Behçet Uz Children's Hospital in İzmir, Turkey and is awaiting its official inauguration (8). The aim of the present study was to determine the knowledge, attitude, and practices of mothers about wet-nursing and human milk banking in Kayseri, Turkey.

MATERIALS and METHODS

Study design and sampling

This was a descriptive study conducted in the family healthcare centers (FHCs) of four community healthcare centers in Kayseri Province. Based on the study by Labiner et al. (4), milking prevalence was accepted as 25%. The minimum sample size was calculated as 284 (95% confidence interval and tolerance value 0.05). Design effect was accepted as 2 due to cluster sampling. The study planned to recruit 625 mothers for the sample in case of a 10% loss. There were 40 FHCs of four public healthcare centers in Kayseri Province (Melikgazi, Kocasinan, Talas, and Hacılar) in February 2012 when the data were collected. Every FHC was accepted as a cluster, and all of the clusters were included in the sample. Sample size was calculated by dividing the sample size to cluster number (625/40), and 16 participants from every cluster was randomly assigned. Ethical approval from the Erciyes University Ethical Committee was obtained for the study (decision no. 2012/172).

Data collection

Mothers who applied for FHC for any reason, were able to establish healthy communication, had at least one child, and had breastfed her child were recruited into the study. Verbal consent was obtained from the mothers. A questionnaire including 33 questions about sociodemographic characteristics (n=14), wet-nursing (n=12), and human milk banking (n=7) related to knowledge (n=24), attitude (n=7), and behavior (n=2) was applied with a face-to-face interview. Mothers were informed about human milk banking prior to attitude questioning. Socioeconomic status was determined by self-definitions of the participants as poor, moderate, good, and very good. Twenty-six participant questionnaires were excluded due to lack of given information, and 614 participant questionnaires were included.

Statistical analysis

Data were analyzed using SPSS version 16.0 (SPSS Inc., Chicago, IL, USA). Being wet-nursed of the mothers was a dependent variable, whereas age, educational status, family type, region of birth, and profession were independent variables. The chi-square test was used for statistical analysis. A p value <0.05 was accepted as statistically significant.

RESULTS

The majority of the mothers were 25-50 years old, housewives, graduated from high school and lower degree, lived in a nuclear family, and lived in the city center. Nearly half of the mothers had 1–2 children, and one in approximately 15 mothers had multiple births (Table 1). Nine out of 10 mothers said that they heard the concept of wet-nursing, whereas 10.7% had her own wet-nurse, and 5.2% had her child's wet-nurse. Of the mothers, 5.0% had been a wet-nurse of another child. Wet-nurses were found to be chosen generally from relatives. Most of the mothers stated that they could milk their breast milk for another child; however, one of approximately six mothers thought that wet-nursing was not right. The reason was religiously forbidden marriage between two foster milk siblings. Half of the mothers defined that microorganisms and diseases may pass through the breast milk, such as hepatitis and acquired immunodeficiency syndrome most frequently (Table 2).

Mothers living in a large family had a significantly higher ratio of having a wet-nurse than mothers growing up in a nuclear family, and mothers aged >50 years old had a significantly higher ratio of having a wet-nurse than mothers <50 years old ($p<0.05$, Table 3).

Table 4 shows the knowledge, attitude, and practices of mothers about human milk banks. The majority of the mothers did not hear about milk banks, its purpose, and services. While approximately three out of five mothers thought that milk banking was correct, mothers disagreed because marriage between foster milk siblings was religiously forbidden, and a disease may be transmitted. The ratio of mothers who said that they would donate breast milk to human milk bank was more than half.

DISCUSSION

Prematurity, low birth weight, gut problems, nutritional intolerance, undeveloped sucking reflex, severe allergy of the infant, lack of social support, and maternal or infantile conditions that cause inability to be together are causes of not breastfeeding infants (9). In these conditions, the best alternative to breastfeeding is donated human milk. There are >300 human milk banks in 38 countries worldwide by the year 2009 (10).

Obtaining wet-nurses for requiring infants is thought as an alternative for human milk banking. Wet-nursing is a traditional practice especially in rural areas in Turkey when the mother cannot breastfeed for a reason (11). In the present study, 5.0% of the mothers wet-nursed, 10.9% had a wet-nurse, and 5.2% had her child's wet-nurse. In a similar study conducted in İzmir, 8.2% of the mothers had wet-nursed, and 10.9% had her child's wet-nurse (12). In a study conducted in the rural part of Denizli, 8.7% of women had wet-nursed, 12.5% had her own, and 7.2% had her child's wet-nurse (13).

However, wet-nursing has been gradually decreased because of formula feeding (9). In the present study, mothers aged >50 years old (17.2%) had a higher ratio of having a wet-nurse than younger mothers (9.6%). This shows the reduction of wet-nursing practice over the years. A higher ratio of having a wet-nurse of mothers who lived in a large family (21.5%) than mothers living in a nuclear family (9.5%) may result from living with older adults. The finding that most of the wet-nurses of mothers (82.3%), mothers' foster children whom they breastfed (74.2%), and wet-nurses of their own children (81.3%) were among their own relatives shows that wet-nursing is still applied between relatives. The reasons why wet-nurses were chosen from relatives or familiar people were being sure it was clean and healthful; wet-nurse's greater love, compassion and mercy; and ease to access to human milk (14-17).

The majority of the mothers had never heard about human milk bank and did not know what it was (93.6% and 97.2%, respectively). Nevertheless, most of the mothers leaned toward to breastfeed another child when needed, to milk her own breast milk to give to another child (79.8%), and despite being to a lesser extent, to donate her own breast milk to a human milk bank (56.2%). The primary reason for not wanting to donate or milk breast milk for another child was religious disapproval of the marriage between foster milk siblings. This attitude might result from sensitivity due to religious beliefs of the mothers. In a study in Erzurum, a similar finding was found that although 64% of the mothers could donate their own breast milk, 48.6% would not get the donated human milk from these banks when needed. Of the mothers, 36.3% have stated that human milk banks were not on religious grounds (10). In a study in Denizli, the ratio of mothers who approved founding a human milk bank (22.9%) and who wanted to donate milk (19.1%) was found to be low, in which the main reason for not donating was shown as forbidden marriage between milk siblings according to religion (13). In a study in İzmir, a higher ratio of mothers had heard about milk banking (41.6% vs. 6.4%) and could donate their breast

milk (68.8% vs. 56.2%) (12). A hospital-based study in Malatya has demonstrated that 44.2% of the mothers would donate breast milk to banks that have single donor application, and 31.9% approved to get human milk from these banks (18).

In a study from Nigeria, of the 680 lactating women, 71% disagreed with getting donated human milk, whereas 60% would volunteer to donate their own breast milk. The reasons for not accepting donated human milk were reported as being afraid of transmission of diseases and genotypes to their babies and religious and cultural taboos. However, still 38% of the mothers were open to using human milk obtained from a relative or a familiar person (19). Actually, in Islam, it is a virtue to donate breast milk, and the Quran commands mothers to breastfeed their children. Unless there is a good reason, it is advised to breastfeed the child for 2 years, and when there is an extraordinary situation, such as health problems or not sucking newborn, providing breast milk to the child by finding a wet-nurse by the father is recommended (20). Being wet-nurse accepted as a biological mother in the Quran proves that there is a strong spiritual bond between the mother and the baby during breastfeeding. Islamic law defines the obligation of constituting the relationship between lactating and sucking breast milk because of its physiological and psychological effects that occur during breastfeeding. This relationship, which is established between the breastfed child and his/her wet-nurse and wet-nurse's certain relative degree, is called as "milk kinship," which is limited to only marriage ban. Therefore, when a person cannot get married with someone due to blood relatedness, then that person also cannot get married with his/her milk relative with any degree (21). Some contemporary Islamic scholars defined that milk obtained from human milk banks would not lead to any type of relatedness (14).

There are three reasons for it. The first reason was that it is obligatory to breastfeed while taking on her lap as mentioned with *radâ* and *ırdâ* words in the Quran to talk about wet-nursing, not by only administering human milk in anyway. The second reason is the idea that uncertainty in the identity of the breastfed child or wet-nurse or uncertainty in the number of breastfeeding would hinder the establishment of milk kinship. The third reason is the Hanafi interpretation that milk that is cooked or mixed with other substances will not breed kinship. The latter view is accepted because donated milk is being heated and cooled (pasteurized) in the human milk banks. In classical Islamic law, the dominant

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view is that a kinship is established between the baby and the mothers that the baby got the donated milk when mixed human milk is used (20).

The International Islamic Fiqh Academy that performs its works with the Organization of Islam Conference has issued a fatwa that "Founding a human milk bank and feeding babies with those donated milk is forbidden in Muslim countries" in 1985 (22). The European Council for Fatwa and Research has issued a fatwa that "Donated human milk can be used when needed but milk relatives cannot get married" in 2004 (23). Despite this fatwa, well-known religious leaders have not changed their minds about milk kinship. Therefore, the basic view in Arab and Muslim countries has been on not founding human milk banks (14). According to a study conducted in Syria and Lebanon, tabloid magazines received a lot of questions about this issue, and people were confused about different published fatwas (17). Ultimately, there is a human milk bank directed based on Islamic rules in the Kuwait Aden Hospital. In this bank, donated milk is obtained from only one donor, and the donor and family who will use the donated milk get introduced while there is a very detailed recording system (24). In another study conducted in Malaysia in which Muslim families are in majority (77%), the procedure was as follows: donor and receiver families talk about religious and ethical issues and newborns (mostly prematures) (53%) were fed with donated milk that was properly collected, stored, and non-pasteurized and donated from only one donor (15). In order to use human milk banks effectively and eliminate problems regarding milk kinship, an accepted religious and cultural approach should be considered in addressing this issue in Muslim countries. Al-Naqeeb et al. (24) have expressed that human milk donated and received by a known donor may be effectively used with safety and hygienic processes and may be an alternative for ethical issues about human milk banks in Muslim countries.

The possibility of finding wet-nurses in rural areas or in large families in urban areas is high. However, given the fact that families currently live mostly in urban areas and in nuclear families in Turkey, wet-nursing is somewhat hard to apply. Similarly, wet-nursing is also difficult to apply in hospitals and newborn intensive care units. Although the details of wet-nursing practices are not exactly explained, wet-nursing should also be applied meticulously as human milk banking (25). A well-designed recording system to collect human milk, to comply with the rules of hygiene, to provide a quality control system, and to follow technological developments should be established (14, 15, 25).

Limitations

Our study has some limitations. Findings from urban and rural regions might be compared by extension of the sample size. In addition, knowledge, attitude, and practices of the fathers might be determined.

CONCLUSION

The majority of the mothers have heard and known about wet-nursing. However, wet-nursing was not common. While more than half of the mothers thought that milk banking was a correct application, those who thought that it was not right were against it because marriage between milk siblings was religiously forbidden. Although human milk banking in Western societies is well organized and performed, it is obvious that this issue will continue to be discussed for a while in Muslim societies. Placing the subjects "milk banks" and "human milk donorship" during education on breast milk in hospitals is important in terms of increasing the awareness of mothers.

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Table 1. Sociodemographic characteristics of the mothers (n=614)

Characteristics	**n**	**%**
Age groups		
<25 years	71	11.6
Between 25 and 50 years	450	73.3
>51 years	93	15.1
Educational status		
Lower than elementary school	72	11.7
Elementary and secondary school	306	49.8
High school	139	22.7
College and university	97	15.8
Profession		
Housewife	461	75.1
Working outside the home	132	21.5
Earns money by working at home	21	3.4
Economic status		
Poor	43	7.0
Moderate	307	50.0
Good	249	40.6
Very good	15	2.4
Family type		

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Nuclear family	549	89.4
Large family	65	10.6
Region spent most of life		
Central Anatolia Region	577	94.0
Other regions	37	6.0
Current location		
City center	396	64.5
Small town	153	24.9
Village	65	10.6
No. of children		
1–2	336	54.7
3–4	139	38.9
≥5	39	6.4
Multiple births		
Yes	41	6.7
No	573	93.3

Table 2. Knowledge, attitudes and practices of mothers about wet-nursing

Variables	**n**	**%**
Hearing about wet-nursing (n=614)		
Yes, heard	546	88.9
No, not heard	68	11.1
Knowing about wet-nursing (n=546)		
Knows	546	100.0
Does not know	0	0.0
Having her own wet-nurse (n=614)		
Yes, has	66	10.7
No, has not	548	89.3

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Relatedness of her own wet-nurse (n=66)		
Relative	55	83.3
Not a relative nor a neighbour	11	16.7
Being a wet-nurse to a child (n=614)		
Yes, she has been	31	5.0
No, she has not been	583	95.0
Reasons for being a wet-nurse to a child (n=31)		
The mother's breast milk did not come	10	32.3
The mother worked	2	6.4
The mother was sick or pregnant	9	29.0
Other reasons	10	32.3
Relatedness of wet-nurse to the family of the child (n=31)		
Relative	23	74.2
Not a relative nor a neighbor	8	25.8
Having her own children's wet-nurse (n=614)		
Yes, they have	32	5.2
No, they do not have	582	94.8
Relatedness of the wet-nurse to her own family (n=32)		
Relative	26	81.3
Not a relative nor a neighbor	6	18.7
Thought of breastfeeding another child when needed (n=614)		
Yes	489	79.6
No	125	20.4
Knowing about the foster milk kinship (n=614)		
Knows	606	98.7
Does not know	8	1.3
Attitude towards marriage between foster milk siblings (n=614)		
Approves	57	9.3
Does not approve	557	90.7

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Reasons for not approving marriage between foster milk siblings (n=557)		
Religiously forbidden	551	98.9
Other reasons	6	1.1
Attitude towards wet-nursing (n=614)		
Approves wet-nursing	509	82.9
Does not approve wet-nursing	105	17.1
Reasons for not approving wet-nursing (n=105)		
The opportunity of formula feeding	23	21.9
The problem of marriage from religious aspects	60	57.1
Other reasons	22	21.0
Opinion about milking her own breastmilk to give another child (n=614)		
Yes, will milk	490	79.8
No, will not milk	124	20.2
Opinion about transition of microorganisms or disease from human milk (n=614)		
Yes, it transits		
No, it does not transit	331	53.9
Does not know	78	12.6
	205	33.4
Opinion about the disease that will transit from human milk (n=331)		
Hepatitis	110	33.2
AIDS	84	25.4
Other diseases	137	41.4

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Table 3. Sociodemographic characteristics of mothers having and not having their own wet-nurses

Sociodemographic characteristics	Wet-nurse				x^2	p
	Having		Not having			
	n	%	n	%		
Age groups						
Aged ≤50 years	50	9.6	471	90.4	**4.760**	**0.029**
Aged >50 years	16	17.2	77	82.8		
Educational status						
Degree less than elementary school	11	15.3	61	84.7		
Elementary and secondary school degree	32	10.5	274	89.5	**2.199**	**0.532**
High school degree	15	10.8	124	89.2		
College and university degree	8	8.2	89	91.8		
Family type						
Nuclear family	52	9.5	497	90.5	**8.821**	**0.003**
Large family	14	21.5	51	78.5		
Profession						
Working outside the home	12	10.4	103	89.6	**0.015**	**0.904**
Other	54	10.8	445	89.2		

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Table 4. Knowledge, attitude and practices of mothers about human milk banking

Variables	n	%
Having heard of human milk banks (n=614)		
Yes	39	6.4
No	575	93.6
Knowing about human milk bank (n=614)		
Knows	17	2.8
Does not know	597	97.2
Is there a human milk bank in Turkey (n=614)?		
Yes, there is	7	1.1
No, there is not	75	12.3
Does not know	532	88.6
Is human milk banking a correct application (n=614)?		
Yes, it is	378	61.6
No, it is not	236	38.4
Reason why human milk banking is not a correct application (n=236)		
Possible marriage with foster milk sibling	178	75.4
Transmission of diseases	40	16.9
Other reasons	18	7.7
Opinion about milking and donating her own breast milk (n=614)		
Yes, would milk and donate	345	56.2
No, would not milk and donate	269	43.8
Reason for not donating her own breast milk (n=269)		
Religious problem about marriage with foster milk sibling	179	66.5
Not wanting to give to a person that she does not know	43	16.0
My breast milk is enough only for my child	12	4.5
Other reasons	35	13.0

This article has been accepted for publication and undergone full peer review but has not been through the copyediting, typesetting, pagination and proofreading process, which may lead to differences between this version and the Version of Record. Please cite this article as: Yılmaz M, Aykut M, Şahin H, Ongan D, Balcı E, Gün İ, et al. Knowledge, Attitude, and Practices about Wet-Nursing and Human Milk Banking in Kayseri, Turkey. Erciyes Med J 2018; DOI: 10.5152/etd.2018.18080.